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Original Communications

END RESULTS OF AMPUTATION OF THE CERVIX AND TRACHELORRHAPHY*

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IT IS a far cry from the crude amputation of the cervix, with the ecraseur, to the finished surgical procedure devised by Sims and perfected by Emmet and the conservative trachelorrhaphy of Emmet. The technic of these masters has survived for a little over a half century and during this time there has arisen a considerable literature *pro* and *con*. Some writers refer to trachelorrhaphy as "uterine tinkering" and others hold that subsequent to amputation there is a high percentage of sterility and if by chance pregnancy occurs it is likely to end in abortion or premature labor or if it should go to term there will be more or less dystocia. A few even contend that, after amputation of the cervix, elective cesarean section is indicated in subsequent pregnancies. Such sequelae are unquestionable if cervix operations are performed without proper technic or indications.

Almost fifty-nine years ago Emmet[1] performed his first trachelorrhaphy, as he believed amputation of the cervix unnecessary except for removal of a cauliflower growth, malignant disease or excessive hypertrophy sometimes several inches in length. But after thirty-five years' experience with the operation, he states "for many years I held the opinion that it was possible, in almost every instance, by careful local and general treatment to restore in time the lacerated tissues to so near the normal condition that, when the operation (trachelorrhaphy) had been properly performed complete restoration would eventually take place with the result of bringing about involu-

*Read in abstract at the Forty-Fourth Annual Meeting of the American Gynecological Society, June, 1921, Swampscott, Mass.

tion of the uterus. But I am now of the opinion that there are exceptions to this rule, when it is better surgery to amputate a portion or the whole of the cervix provided the diseased tissues are completely removed and the wound treated in the manner I shall describe." This quotation gives us the indication for cervical repair of a quarter of a century ago as recognized by the originator of trachelorrhaphy and the man most capable of carrying out the technic.

Hirst,[2] Crossen,[3] Eden and Lockyer,[4] Anspach,[5] and Graves,[6] all agree on the indications for trachelorrhaphy but Anspach limits amputation to women past the childbearing period and Graves to procidentia. Others, including Sturmdorf,[7] question the efficacy of either procedure.

The most recent statistics of the postoperative results of amputation of the cervix and trachelorrhaphy are those of Leonard[8] which are based on replies to circular letters received from 128 of 400 cases of amputation of the cervix, performed during the preceding twenty years, and from 39 of the cases of trachelorrhaphy, performed during the preceding ten years, in the Gynecological Clinic of the Johns Hopkins Hospital. The method of operation in this series of cases was either "almost without exception, a high amputation . . . from 2.5 to 3 cm. of the cervix above the external os being removed" or the classical trachelorrhaphy of Emmet. The indications governing the selection of the method of operation was almost invariably to amputate a cervix badly infected or one showing multiple lacerations and to use trachelorrhaphy in those cases presenting one or two more or less discrete lacerations and without a marked endocervicitis. Sturmdorf, after giving a summary of Leonard's conclusions says, "accepting these data from authoritative sources, as a correct exposition of facts, the obvious deduction is, that with chronic endocervicitis as the recognized pathologic indicator, trachelorrhaphy is an inadequate, and cervix amputation an injurious, operation."

To me it seems unfair to condemn the old and tried methods of cervical repair of Sims and Emmet and to recognize the newer and less tried tracheloplasty methods as a specific in all cervical disease. Especially is this true if we accept the statistics of Leonard for high amputation and apply them to all degrees of amputation. Thus the time seems ripe to study another series of cases of cervical operations and to compare the postoperative results of amputation of the cervix and trachelorrhaphy.

At the Woman's Hospital from January 1, 1916, to January 1, 1919, there were admitted approximately 6503 gynecological patients and alone or combined with other operative procedures 11 per cent had cervical operations. Amputation of the cervix was performed 461 times and trachelorrhaphy was performed 232 times. Two-thirds of

the amputations and seven-eighths of the trachelorrhaphies were done on women under forty years of age, and were about equally combined with vaginal plastic and abdominal operations. This series is composed of 305 private cases and 394 ward cases performed by 41 individual operators. Two hundred eleven, or approximately 30 per cent, have been followed from one to five years. The technic of, and indications for, operation were those of Emmet more or less faithfully carried out, namely, to excise the diseased cervical tissue by a low, median or high amputation or to perform the classical trachelorrhaphy.

PLAN OF STUDY

To classify the cases and to find the immediate results the individual hospital records of the 693 cases were carefully gone over. The remote or end results were obtained, from the ward cases, by writing to each patient to report to their follow-up clinic and when they did not report, a questionnaire was sent requesting that it be filled out and returned to the Record Department of the hospital. For the private cases, questionnaires were sent to their surgeons who were asked to return their end results with the privilege of using them in this report. In this manner 67 ward cases were re-examined by ten examiners and 75 returned complete questionnaires two and one-half to five years after operation. Among the private cases, 69 were re-examined by 17 operators from one to five years after operation. Combining these returns we have 136 cases re-examined from one to five years and our end results based on letters in only 75 ward cases. Included in these 211 cases, there were 132 amputations of the cervix and 79 trachelorrhaphies. Amputation was done in 81 patients under forty years of age and in 51 patients over forty years of age. Trachelorrhaphy was done in 74 under and in 5 over forty years of age. Seventy-three amputations and 33 trachelorrhaphies were done alone or were combined with other vaginal plastic operations, 56 amputations and 45 trachelorrhaphies had in addition some form of conservative abdominal operation, and three amputations and one trachelorrhaphy accompanied a bilateral salpingectomy. Approximately 64 per cent of the cases were re-examined, one to five years subsequent to operation. The personal equation of the author has been eliminated as he is merely the tabulator, in the great majority of the cases, of the findings recorded by a number of examiners. Further but 35.5 per cent of our end results are dependent upon answers to circular letters, as compared to 100 per cent in Leonard's series.

PATHOLOGY OF CERVICAL TISSUE REMOVED

About 67 per cent of the specimens of cervical tissue removed at operation was subjected to a microscopic examination including about

92 per cent removed by amputation and about 18 per cent removed by trachelorrhaphy. Approximately 76 per cent of the tissue specimens examined, showed cervical changes other than simple lacerations. This was present in cases of amputation in about 76 per cent and in cases of trachelorrhaphy in about 71 per cent. These changes, in their order of frequency were erosion, cervicitis, hyperplasia, endocervicitis, circulatory disturbance, precancerous changes, and carcinoma. It is most interesting to note that in 466 cases in which the tissue was examined microscopically, there was but one case each of precancerous change and carcinoma.

I. IMMEDIATE RESULTS

1. *Secondary Hemorrhage.*—There were 8 cases of secondary hemorrhage, or 1.2 per cent in our series. In none of these cases was it necessary to resort to resuturing and in but one case was it necessary to use a vaginal pack, and in all but three of these cases there was subsequent primary union. Hemorrhage occurred on the second day in 2 cases, the sixth day in 1 case, the ninth day in 2 cases, and the twelfth day in 3 cases. Thus less than ½ per cent of the amputations (2 of 461) and about 2.5 per cent of the trachelorrhaphies (7 of 232) were complicated by secondary hemorrhage. The percentage of hemorrhage, but not the degree conforms with the earlier reported cases following trachelorrhaphy of Goodell and Emmet[9] rather than the more recent cases reported by Leonard. The latter in his study found six of 128 amputations severe enough to require resuture, or 4.7 per cent, and two of 39 cases of trachelorrhaphy which were controlled by vaginal pack, or 5.1 per cent. The low percentage for amputation in our series as compared to Leonard's, is possibly due to two factors. First, high amputation was the exception rather than the rule and, second, a vaginal pack was usually placed following all cervical operations. An interesting fact in this connection is that but three of these cases, all trachelorrhaphies, were followed by secondary or partial union which would seem to indicate that the hemorrhage was due to faulty hemostasis or errors of technic in tying the sutures which caused necrosis of the tissues rather than a sepsis from existing endocervicitis.

2. *Secondary Union or Partial Primary Union.*—In addition to the three cases of secondary or partial primary union, there were five cases of secondary or partial union or a fraction over 1 per cent (8 of 693). Four occurred after trachelorrhaphy and four after amputation, about 2 and 1 per cent, respectively. Three of the four cases of secondary or partial union in trachelorrhaphy were subsequent to secondary hemorrhage, and one of the four amputations in which secondary or partial union resulted was a case in which an extensive vaginal

section was also done. In none of the cases was there a serious sepsis which in any way contributed to the mortality in this series of cases.

II. REMOTE OR END RESULTS

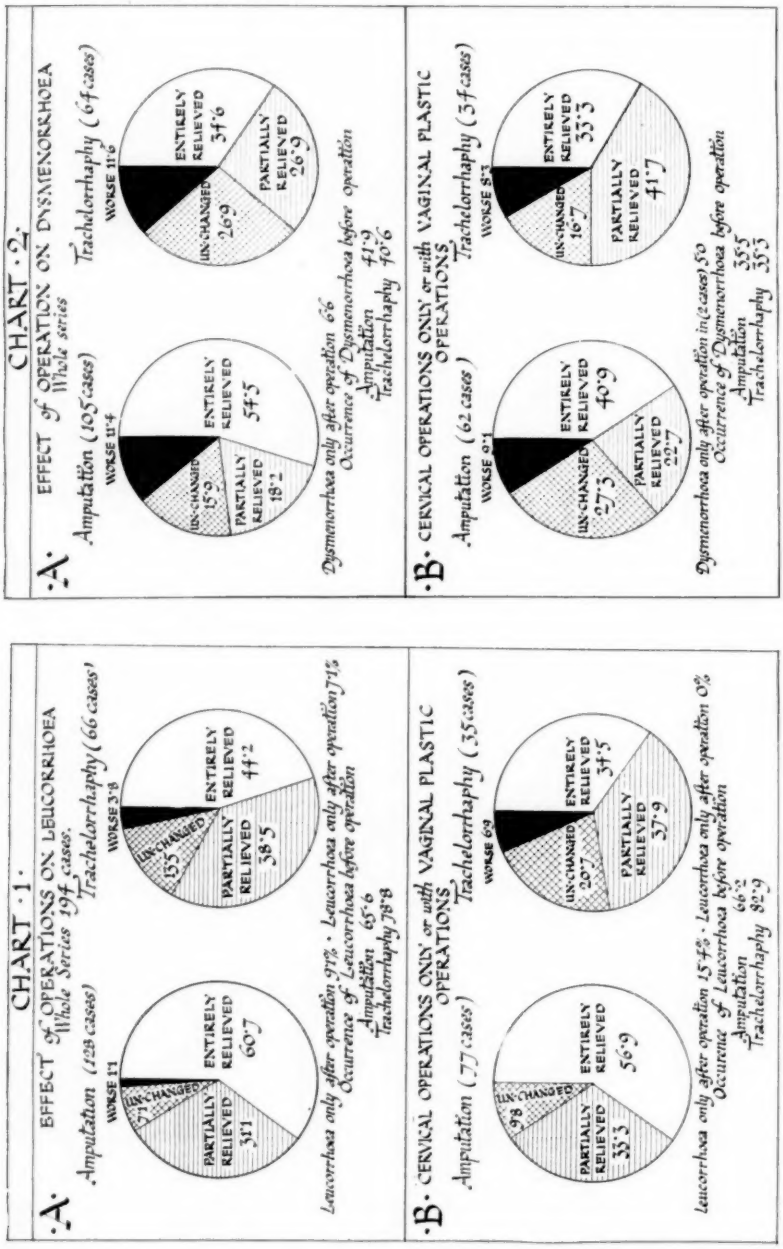
1. *General Health.*—The influence of cervical operations on the general health is a complex question and one that must be almost entirely analyzed from a subjective basis. This is necessarily the case as primarily the patient must be relieved of the symptoms for which she sought operation. A review of the following table shows that trachelorrhaphy alone gives a little over 16 per cent greater improvement in the general health than amputation alone. On the other hand, amputation when combined with vaginal plastic operations gives almost 21 per cent greater improvement in the general health than trachelorrhaphy combined with vaginal plastic operations. When combined with abdominal operations, the difference for the two methods is negligible as they both show improvement in over 86 per cent. The discrepancy in the end results of amputation and trachelorrhaphy alone when contrasted with the results when they are combined with vaginal plastic measures seems to be explained on the theory that in the cases requiring amputation the primary injury also caused lesions in the vagina which should have been repaired to relieve the symptoms and thus improve the general health. Thus our statistics indicate that both methods improve the general health but the greater improvement results from amputation when combined with plastic repair.

TABLE I

INFLUENCE OF AMPUTATION AND TRACHELORRHAPHY ON THE GENERAL HEALTH

OPERATION	NUMBER OF CASES	NUMBER OF CASES IMPROVED
Amputation	12	8 (66.6%)
Trachelorrhaphy	12	10 (83.3%)
Amputation and vaginal plastic operations	48	42 (87.5%)
Trachelorrhaphy and vaginal plastic operations	21	14 (66.6%)
Amputation and abdominal operations	53	47 (86.8%)
Trachelorrhaphy and abdominal operations	48	43 (89.6%)
Totals—		
Amputation	113	97 (85.8%)
Trachelorrhaphy	81	67 (82.7%)
	194	164 (84.5%)

2. *Leucorrhea.*—The most frequent cause of persistent vaginal discharge is cervical disease and in the multiparous woman the predisposing cause is cervical laceration. On this basis it is interesting to determine, in our series of cases, the occurrence of leucorrhea before operation and its degree or cure after operation (see Chart 1).



In 194 cases of cervical operations a leucorrhea more or less constant and of varying degrees occurred in 70.1 per cent, before amputation in 65.6 per cent and before trachelorrhaphy in 78.8 per cent. To determine accurately the end results for leucorrhea requires examinations made from time to time but unfortunately, in most of our cases, the end results are based on one examination made from one to five

years after operation. The discharge present may be due to a reinfection of a cervix restored to the normal by operation or the discharge may have eventually disappeared notwithstanding. This applies equally to both methods of operating; it seems reasonable to assume that any difference in the end results would be due to the form of operation.

Subsequent to amputation the leucorrhea was entirely relieved in 60.7 per cent and partially relieved in 31.1 per cent as compared to trachelorrhaphies with subsequent entire relief in 44.2 per cent and partial relief in 38.5 per cent. As to the character of the existing leucorrhea after amputation it was unchanged in 7.1 per cent and worse in 1.1 per cent and for trachelorrhaphy it was unchanged in 13.5 per cent and worse in 3.8 per cent. In cases without leucorrhea before operation, it was present in 4 of 44 cases, or 9.1 per cent, for amputation and in 1 of 14 cases, or 7.1 per cent, for trachelorrhaphy.

If we exclude cervical operations combined with abdominal section which show an almost equal percentage of improvement for each method of operating (94.0 compared to 95.6), there will remain cervical operations alone or combined with vaginal plastic operations. From this series, cervical operation being the principle cause of the change in the vaginal discharge, we obtain definite end results. Therefore for amputation with existing leucorrhea in 66.2 per cent and for trachelorrhaphy with existing leucorrhea in 82.9 per cent, there was for amputation, contrasted with trachelorrhaphy, 22.4 per cent more complete relief (56.9 compared to 34.5) but 4.6 per cent less partial relief (33.3 compared to 37.9) and 10.9 per cent fewer cases in which the leucorrhea was unchanged in character. On the other hand, following amputation no cases were made worse whereas following trachelorrhaphy 2 of 35 cases, or 6.9 per cent, were worse. But 4 of 26 cases, or 15.4 per cent, of the cases subjected to amputation who were free of leucorrhea now had a mild degree of vaginal discharge.

Finally, amputation of the cervix is more efficient than trachelorrhaphy in the cure of leucorrhea, but more often than trachelorrhaphy causes a leucorrhea in cases previously free from a vaginal discharge. Such end results are not surprising even if we accept the theory that endocervicitis is the principal cause of leucorrhea. For it is unreasonable to assume that in every case of leucorrhea all the cervical glands, from the external to the internal os, are diseased. Therefore, as demonstrated by our series of cases, there is a place even in the treatment of leucorrhea for low, medium and high amputation and to a lesser degree for trachelorrhaphy. The end results further demonstrate the necessity for careful study of the indications and the performance of proper technic or too small an external os will result or some of the diseased glands will be left and the vaginal discharge

will be worse in character or it will occur in cases free of leucorrhea before operation.

3. *Dysmenorrhea.*—In the nullipara, malformation or disease of the cervix is recognized as a causative factor of dysmenorrhea, but in the multipara laceration and its accompanying disease has received but scant attention as a cause of dysmenorrhea. However a review of Chart 2 of cervical operations shows an existing dysmenorrhea in 41.4 per cent; for amputation in 41.9 per cent and for trachelorrhaphy in 40.6 per cent.

Subsequent to amputation there is entire relief of dysmenorrhea in 54.5 per cent and partial relief in 18.2 per cent as compared to trachelorrhaphy with entire relief of the dysmenorrhea in 34.6 per cent and partial relief in 26.9 per cent. The degree of remaining dysmenorrhea was, for amputation, unchanged in 15.9 per cent and worse in 11.4 per cent as compared to trachelorrhaphy with the pain unchanged in 26.9 per cent and worse in 11.6 per cent. However, in cases free from monthly pain before operation it was subsequently present only after amputation in 6.6 per cent.

If we deduct the cervical operations combined with abdominal section, which give for amputation 31.8 per cent more entire and partial relief of the dysmenorrhea than trachelorrhaphy there remain cervical operations alone or combined with vaginal plastic operations. Thus for amputation contrasted with trachelorrhaphy with about an equal percentage of existing dysmenorrhea (35.5 compared to 35.3) there was for amputation 7.6 per cent more entire relief from the dysmenorrhea (40.9 compared to 33.3) but there was 19.0 per cent less partial relief (22.7 compared 41.7). Therefore while trachelorrhaphy gives more cases with an improvement of the dysmenorrhea yet amputations give more cures of this symptom. Of the unimproved cases amputation contrasted with trachelorrhaphy gives 10.6 per cent more cases with the dysmenorrhea unchanged in character (27.3 compared to 16.7) but for each operation there is about the same percentage of the cases (9.1 compared to 8.3) in which the character of the pain was worse after operation. However, only after amputation in 40 cases free from dysmenorrhea before operation it was now very severe in 2 or 5 per cent.

Finally amputation, as compared with trachelorrhaphy, is more efficient in the cure of dysmenorrhea but both operations cause the existing pain to be more severe in character in from 8 to 11 per cent of the cases and amputation alone causes subsequent dysmenorrhea in from 5 to 6 per cent of the cases previously free from menstrual pain. Thus there is the necessity for careful study of the individual case and the application of the proper operation and technic for each case or the external os may be made too small or the cervical canal

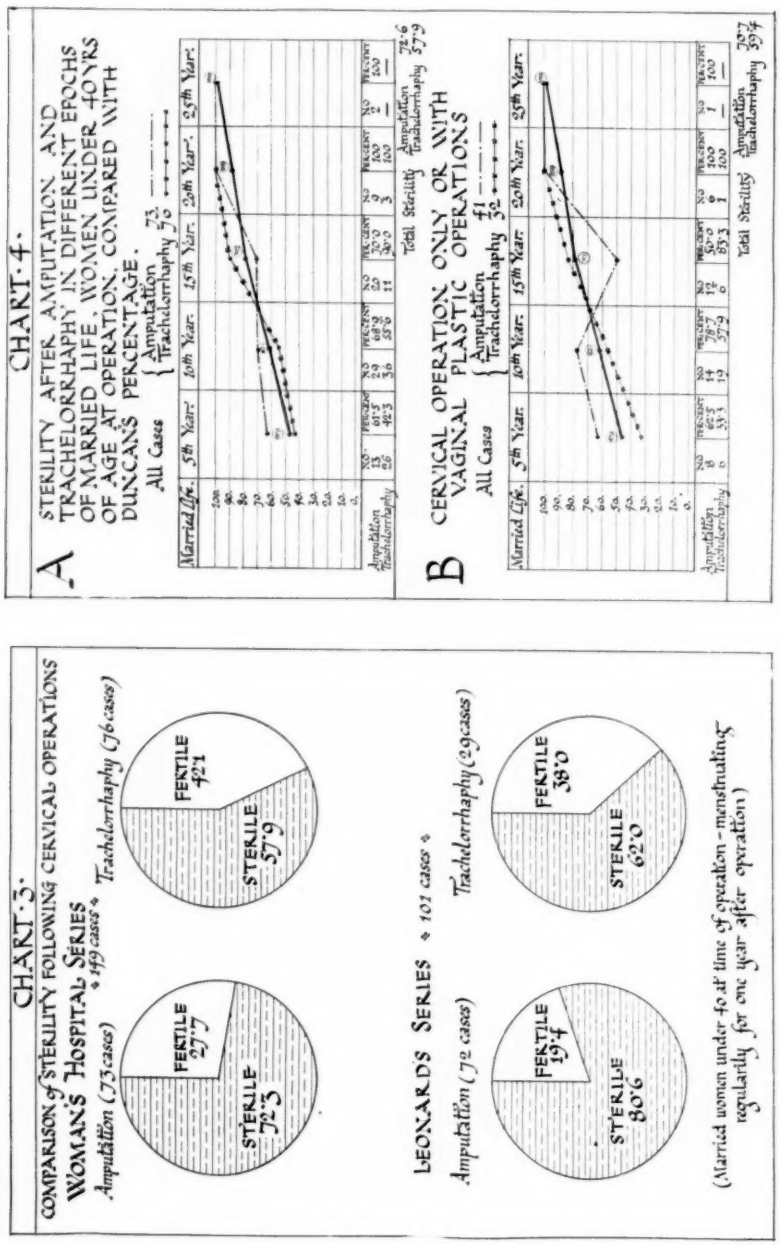
may become stenosed. For amputation the increased dysmenorrhea may be due in part, as has been held by some writers, to the scar which is perpendicular to the long axis of the cervical canal and by contracting may cause a narrowing of the canal. This was probably the condition in the following history of one of the two cases of amputation in which dysmenorrhea was present only after operation.

Mrs. H. was operated upon by a divulsion and curettage, with dull curette, and the cystic portion of the cervix was excised and the raw edges were coapted with chromic gut sutures, four being used as canal sutures, uneventful recovery, no secondary hemorrhage or unusual vaginal discharge. On discharge from the hospital there was no eversion of the cervical flaps and there was primary union. Some time later, because of severe dysmenorrhea the cervical canal had to be dilated and a stem pessary introduced. Thus the dysmenorrhea was eventually cured.

4. *Sterility.*—Many factors have to be considered in determining the cause of sterility. Duncan[10] has shown that the age at marriage and the number of years married must be taken into account in our final analysis.

Unfortunately, successful operations on the cervix and vagina often produce increased voluntary sterility. The most frequent cause is the fear, held equally by the patient and her medical adviser and many times by the gynecologist and obstetrician, that labors subsequent to successful plastic operations will result in conditions as bad or even worse than those from which the patient had been relieved. This fear of bearing children, after operation, is shown in our series, as in 72 questionnaires, 84 per cent of the women stated that they were not anxious for more children, 8 per cent acknowledged the use of contraceptive measures and a few had practiced continence. Further there were three elective cesarean sections performed for indications, in part due to the fear of undoing successful repair work or the fear of dystocia due to these operations. In our final analysis of cervical operations and the bearing on secondary sterility all available facts must be taken into consideration.

Among 149 women in the childbearing period (see Chart 3) under forty years of age at time of operation and menstruating regularly for at least one year after operation, there was sterility of 72.6 per cent for 73 cases of amputation compared to a sterility of 57.9 per cent for 76 cases of trachelorrhaphy or a greater sterility following amputation of 14.7 per cent. In Leonard's series of 101 similar cases there was sterility in 80.6 per cent of 72 amputations compared with sterility of 62.0 per cent of 29 trachelorrhaphies or a greater sterility for amputation of 18.6 per cent. As my series is made up of low, medium and high amputations and there is almost an equal number of cases of amputation and trachelorrhaphy, I believe 14.7 per cent more accurately represents the increase of sterility which follows amputation of the cervix. Therefore, in all cases, where cervical



operations are used with other operations a little less than three-fourths of those subjected to amputation remain sterile whereas one and a half times more cases of trachelorrhaphy than amputation were subsequently fertile.

This increase of sterility after amputation in my series cannot be explained on the ground of the different age at marriage or the differ-

ent number of years married. This is brought out in a classification of the cases which shows that the sterility for trachelorrhaphy when compared amputation is even less or more nearly corresponds to the percentages established by Duncan. This is true for cervical operations alone or combined only with vaginal plastic operations as it is for the whole series of cases. This is graphically shown, for the different epochs of married life, in Chart 4.

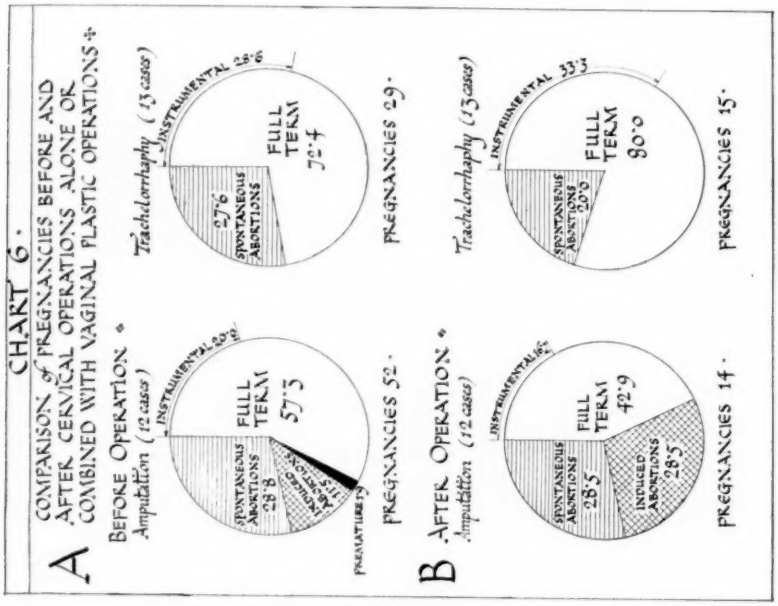
Women in the childbearing period, classified according to different groups of operations (Table II), show 11.3 per cent greater sterility for amputation; for the amputation and trachelorrhaphy combined with round ligament or uterosacral shortening or ventral suspension or a combination of these operations, it shows 15.2 per cent greater sterility in the cases of amputation; and in amputations and trachelorrhaphy combined with myomectomies, or resections of one or both ovaries, or salpingoöophorectomy unilateral or a combination of these operations there was 18.2 per cent greater sterility for the cases of amputation. Therefore as there is a marked influence of the intraabdominal operations it seems reasonable to exclude these cases and to base our final analysis only on cases in which cervical operations alone or in combination with vaginal plastic work have been done. Thus the increase of sterility for cases of amputation compared to trachelorrhaphy is 11.3 per cent.

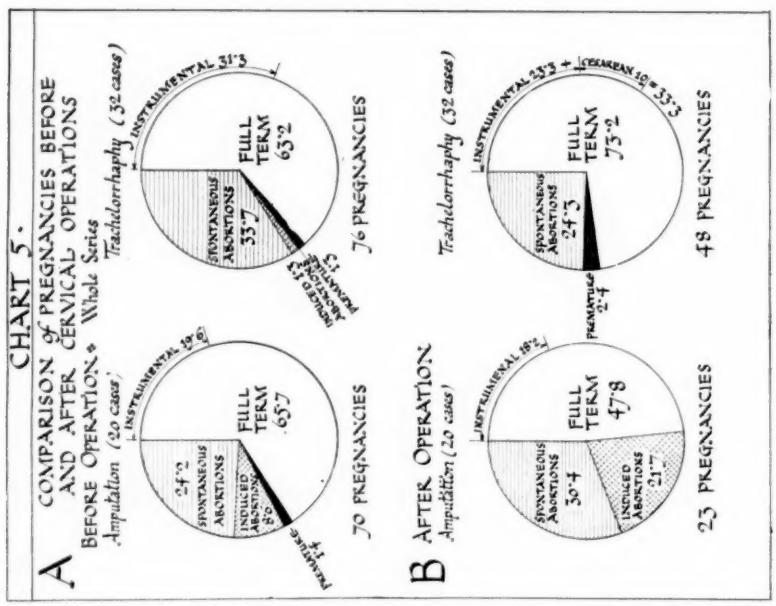
TABLE II

OPERATIONS ARRANGED IN GROUPS

	NUMBER OF CASES	FERTILE AFTER OPERATION	STERILITY
A. Cervical Operations alone or with Vaginal Plastic Operations.			
Amputation	41	12	70.7%
Trachelorrhaphy	32	13	59.4%
B. Cervical Operations with Abdominal Operations for Uterine Displacement.			
Amputation	21	7	66.7%
Trachelorrhaphy	33	16	51.5%
C. Cervical Operations with Conservative Abdominal Operations.			
Amputation	11	1	90.9%
Trachelorrhaphy	11	3	72.7%
Totals—			
Amputation	73	20	72.6%
Trachelorrhaphy	76	32	57.9%

5. *Course of Pregnancies after Cervical Operations.*—To determine the cause of abortion, of premature labor, or of dystocia in women who give a history of former easy full-term labors is often a difficult task. Therefore to classify the character of the pregnancies and labors and to assign their cause to different operative procedures, of necessity in different series of women, makes the problem become even more difficult. However, if we compare pregnancies and labors before and after amputation of the cervix and before and after trachelorrhaphy, we are able in each group to establish the influence of operation on the subse-





quent pregnancies and labors. Then using these facts as a check in comparing the subsequent pregnancies and labors, of necessity in a different series of cases, should give fairly accurate facts as to the occurrence of abortion, premature labor and dystocia as a result of amputation of the cervix or of trachelorrhaphy.

(*a*) *Premature Labor and Abortion.*—Comparing pregnancies be-

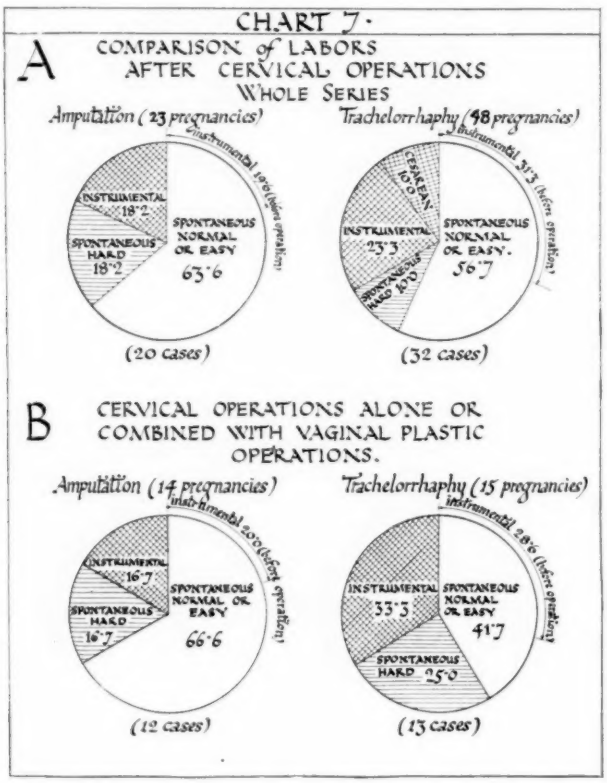
fore and after amputation (Chart 5), we find, after amputation, 17.9 per cent fewer full-term labors, and 6.2 per cent more spontaneous abortions. Of the remaining pregnancies interrupted before term there were, after amputation, no premature labors as compared to 1.4 per cent before operation but there was an increase of two and a half times the number of induced abortions. Comparing the pregnancies before and after trachelorrhaphy we find a 10.0 per cent increase of full-term pregnancies and a decrease of 9.4 per cent in the spontaneous abortions, but twice as many premature labors (1.3 compared to 2.4). Thus in like groups of cases amputation decreases and trachelorrhaphy increases the number of full-term labors while the opposite is true for spontaneous abortions. But premature labor which occurred in an equal percentage (1.3) before operation recurred only after trachelorrhaphy.

With these facts established let us contrast, of necessity in different series of cases, the pregnancies following amputation with those following trachelorrhaphy. There were 25.4 per cent fewer full-term labors, and 6.1 per cent more spontaneous abortions but no premature labors for amputation as compared with trachelorrhaphy which had 2.4 per cent premature labors.

To obtain more accurate statistics let us contrast, in the same way, cervical operations alone or combined with vaginal plastic operations (Chart 6). Comparing the pregnancies before and after amputation we find for the latter cases 14.4 per cent fewer full-term labors and about an equal number of spontaneous abortions. Of the remaining cases interrupted before term we find no premature labors after operation as compared to 1.9 per cent before operation but an increase after operation of over twice as many induced abortions. Comparing the pregnancies before and after trachelorrhaphy we find 7.6 per cent more full-term labors and a decrease of 7.6 per cent of spontaneous abortions. Thus in the same series and like groups of cases amputation decreases and trachelorrhaphy increases the number of full-term labors but while trachelorrhaphy decreases the number of spontaneous abortions amputation has but little effect one way or another, but it is followed by more cases of induced abortions.

Now let us contrast the pregnancies following amputation with those following trachelorrhaphy. There were, for amputation, 37.1 per cent fewer full-term pregnancies and 8.5 per cent increase in the spontaneous abortions and 28.5 per cent of induced abortions with none following trachelorrhaphy. Finally, taking all facts under consideration, amputation of the cervix is more often than trachelorrhaphy followed by the interruption of labor before term, but is no more likely than trachelorrhaphy to be followed by premature labor. While the final analysis of cervical cases alone or with vaginal plastic opera-

tions showed for amputation practically no increase of spontaneous abortions yet trachelorrhaphy showed a slight reduction of spontaneous abortions. This confirms the well accepted fact of cervical laceration as a cause of abortion and the reason it does not apply to amputation is in proportion as high amputations occur in the series. While we lack definite records of our high amputations it is reasonably certain that of eleven full-term pregnancies but one followed high amputation and of five spontaneous abortions, with no contributing cause, two of them followed high amputation. This fact is substanti-



ated by Leonard's series of high amputations, which showed the interruption of pregnancy before term in 64.0 per cent of which 45.0 per cent were abortions.

(*b*) *Dystocia.*—In labors before cervical operations our only available data of dystocia are the use of forceps. Comparing labors before and after amputation, there is present about the same percentage of instrumental deliveries and the labors after trachelorrhaphy show a slightly higher percentage of instrumental deliveries than before operation. The three elective cesarean sections must be

included in this end result as there was an apparent if not an actual dystocia—the "cervices showing no prospect of safe dilatation."

Comparing labors before and after cervical operations alone or combined with vaginal plastic operations we find after amputation a slight decrease of instrumental deliveries and after trachelorrhaphy a slight increase of instrumental deliveries. Note that in this series there were no cesarean or other operative cases.

For spontaneous labors we have definite data for dystocia only as it occurred after operation. Thus for amputation we find a slightly higher percentage of labors classified as spontaneous, normal, or easy. However, after amputation, compared to trachelorrhaphy, there are about 8.0 per cent more cases classified as hard spontaneous labors but a little more than half as many operative deliveries.

Comparing subsequent spontaneous labors after cervical operations alone or combined with vaginal plastic operations, we find, after amputation as compared to trachelorrhaphy almost 25 per cent more spontaneous easy or normal labors with 8.3 per cent fewer cases classified as hard spontaneous labors and about half as many instrumental deliveries.

Therefore considering dystocia from the data at hand, it is more frequent after trachelorrhaphy than after amputation and I feel it is at its minimum for trachelorrhaphy, as some of the cases classified as spontaneous, normal, or easy deliveries would have shown dystocia but for a laceration of the cervix before full dilatation and for amputation this occurrence was less frequent.

(*c*) *Relaceration of the Cervix.*—Our statistics are incomplete as to relaceration of the cervix in labors following cervical operations. However, of cases of amputation examined after spontaneous labors 2 of 5 cases, or 40.0 per cent, showed relaceration and for trachelorrhaphy, under similar conditions, 6 of 12 cases, or 50 per cent, showed relaceration.

A review of the following abstracts of pregnancies and labors before and after amputation of the cervix and after trachelorrhaphy will, I believe, substantiate my analysis for dystocia.

CASE REPORTS ILLUSTRATING CASES OF LABOR BEFORE AND AFTER CERVICAL OPERATIONS

I. Amputation of the Cervix.

1. *Forceps Deliveries in Subsequent Labors.* (2 of 11 full-term deliveries or 18.2 per cent)

CASE 1.—Mrs. G., twenty-two years of age, married six years. Two full-term labors, first, instrumental in 1911. A 10 pound living child. Second, three years later delivered of a living baby by breech extraction. Unsuccessful perineorrhaphy after first delivery, fever following each delivery.

Amputation of cervix, repair of cystocele and pelvic floor. In the subsequent labor the first stage lasted 11 hours and 35 minutes, with moderate pains, regular, but infrequent. Second stage 2 hours and 44 minutes, pains, strong, regular, frequent but ineffectual. Third stage 6 minutes. Total duration of labor, 14 hours and 25 minutes. Position, L. O. A., at outlet O. A. Complication, prolapsed cord, narrow bi-ischial diameter.

After fourteen hours of labor the head deeply engaged and greatly moulded but there was no progress for two hours although there had been hard pains and the baby was passing some meconium. High median forceps applied and head extracted with great difficulty, median episiotomy on account of scar tissue in the perineum which was beginning to split. Male baby 9 pounds in weight.

NOTE: Dystocia was not due to the amputation of the cervix but to the large size of the child and to pelvic contraction as her previous labors were hard, first instrumental and second a breech, and there was a distinct narrowing of the bi-ischial spines.

CASE 2.—Mrs. N., 26 years, married 6 years, two children, no abortions or miscarriages. First labor, 1914, dry, spontaneous, 9½ hours, with male child, 7 pounds, 12½ ounces. Second labor, 1916, dry, spontaneous, 9 hours, male child, 8 pounds and 15 ounces. Operation, January 26, 1917, median amputation of cervix, repair of pelvic floor, Alexander's operation.

Subsequent dry labor with no real pains until the end of 14½ hours, when the cervix was fully dilated. Position L. O. P., converted and after pituitrin 1 c.c. and strychnine 1/20 by hypodermic, the pains became regular, frequent and effectual. Later, after an interval of three and a quarter hours there was no advance of the labor and low forceps were applied and a male child, 9 pounds and 14 ounces, was delivered. Total duration of labor, 18 hours and 3 minutes. First degree perineal tear.

NOTE: This labor was twice as long as either previous delivery due to the L. O. P. position, large baby and the lack of real labor pains but the cervix was not the cause of dystocia as it was fully dilated without effectual pains and without the aid of the bag of waters.

2. *Hard Deliveries in Subsequent Labors.* (2 of 11 full-term deliveries or 18.2 per cent)

CASE 1.—Mrs. McK., thirty-four years, admitted August 27, 1917. Married three years, never pregnant. Chief complaint, procidentia and cervical growth. Operation for cystocele, median amputation of cervix, transposition of uterosacral ligaments (Jellet's Operation) and repair of pelvic floor. Result partially satisfactory. Readmitted four months later because of retroversion of uterus and vaginal prolapse. Second operation for cystocele, Alexander's for retroversion and repair of pelvic floor.

Subsequent labor, 2½ years after last operation. Membranes ruptured spontaneously and labor lasted 10 hours and 40 minutes. In three hours and fifteen minutes from the beginning of labor, the cervix was dilated three fingers. Pituitrin M 10 at end of second stage and a female child, 7 pounds and 6 ounces, was delivered. Immediately following birth of head there was a sudden gush of blood, inspection revealed lacerations of anterior and right lateral walls of vagina; as well as around the urethra, posterior wall intact. The laceration of anterior wall about 3 inches in length. Lacerations sutured and vaginal pack placed.

Readmitted to hospital on September 21, 1920, and a vaginal hysterectomy, with over-lapping of broad ligaments and the fascia of anterior wall and a repair of pelvic floor was done.

NOTE: The unhappy sequelae in this case were not due to the amputation of the

cervix but to the extensive and frequent operations and possibly to the injudicious use of pituitrin.

CASE 2.—Mrs. P., twenty-seven years, married 3 years, two spontaneous, hard labors, no abortions or miscarriages. Operation, 1918, amputation of cervix and repair of pelvic floor. Subsequently she had what she terms a hard full-term spontaneous delivery.

NOTE: Unfortunately this case was followed up only by a questionnaire, but as there is subjective evidence of the nature of her labors, it is reasonable to assume the hard labors before operation, and the hard labor subsequent to operation were due to the same cause and not to amputation of the cervix.

3. *Easy Deliveries in Subsequent Labors.* (7 of 11 full-term deliveries or 63.6 per cent)

There were seven full-term deliveries in which the subsequent labors were classified as normal or easy. In three of these cases there were previous operative deliveries. In one of these with two previous forceps operations of long duration, the subsequent delivery was spontaneous and two hours in duration. At the ninth month the cervix admitted one finger and at the onset of labor the cervix was three fingers dilated. Of the two others with previous single full-term deliveries, both instrumental, one had a subsequent delivery at full term of nine hours' duration and the other an easy subsequent full-term delivery.

Of the four remaining cases with spontaneous labors before and after operation we have the following: In two there were premature labors at the seventh month and in one the subsequent labor was easy, of fifteen hours' duration and in the other there was a subsequent precipitate labor. In the remaining two cases, one with three previous spontaneous normal labors of an average duration of twenty-four hours each with a subsequent normal labor of twelve hours and the other with seven normal previous labors with a subsequent normal labor.

From a study of subsequent labors in cases of amputation of the cervix, we must question the statistics of others who claim a high percentage of subsequent dystocia and premature labors after this operation.

II. Trachelorrhaphy.

1. *Forceps Deliveries in Subsequent Labors.* (7 of 30 full-term deliveries or 23.3 per cent)

CASE 1.—Mrs. R., 24 years, one instrumental full-term stillbirth. Operation, divulsion and curettage, trachelorrhaphy, repair of pelvic floor, and appendectomy. Two years after operation, delivered at full term after manual dilatation of cervix and median forceps of a living baby boy weighing 7½ pounds. Presentation vertex R. O. A.

NOTE: Both the previous and subsequent deliveries were instrumental but the latter resulted in a live baby after the dystocia of cervix was overcome by dilatation.

In six cases, with instrumental deliveries in their subsequent pregnancies, all had had full-term pregnancies, before trachelorrhaphy, terminated by instruments. In four of these there were single previous full-term pregnancies which resulted in stillbirths although the subsequent pregnancies all resulted in live babies. Of these cases but three were re-examined and two showed a relaceration of the cervix. Of the remaining cases each with two previous pregnancies, one with an instrumental and spontaneous birth with subsequent instrumental delivery and the other with previous instrumental delivery and an abortion with subsequent instrumental delivery.

NOTE: In none of these was the duration of labor or the kind of operative delivery more severe than in previous deliveries and in a few, it was less severe. How-

ever, there was slight dystocia from the repaired cervix in over 42 per cent; in one manual dilation was done and in two there was relaceration of the cervix.

1. (*a*) *Elective Cesarean Section in Subsequent Labors.* (3 of full-term deliveries or 10 per cent)

CASE 1.—Mrs. D., twenty-six years, one full-term pregnancy, baby delivered by a forceps operation of long duration. Operation, divulsion and curettage, trachelorrhaphy, repair of pelvic floor, shortening of round ligaments and appendectomy. Two years later patient delivered, at term, by cesarean section because of extensive perineal and cervical repair following previous labor. The cervix showed no prospect of safe dilatation and there was a large unengaged head. Living male baby weighing 8 pounds and 11 ounces.

CASES 2 and 3.—These two sections were in successive pregnancies in the same patient. Mrs. A., thirty-four years, married ten years. Four full-term, normal deliveries. Operation, trachelorrhaphy, repair of pelvic floor, resection of left ovary and appendectomy. In the following three years patient was delivered twice, at term, by elective cesarean section for a large baby and a cervix which did not promise satisfactory dilatation and also to avoid possible extensive injury to the small parts.

NOTE: In all three of these cases there was an apparent dystocia due to the trachelorrhaphy.

2. *Hard Deliveries in Subsequent Labors.* (3 of 30 full-term labors or 10 per cent)

CASE 1.—Mrs. E., thirty-four years, married eighteen years. Four spontaneous full-term children and two abortions. Last child seven years ago and last abortion four years ago. Operation, divulsion and curettage, trachelorrhaphy and repair of pelvic floor. Subsequent labor was at full term and patient reported in her questionnaire that it was a "hard labor."

CASE 2.—Mrs. L., thirty years, married seven years. Four years ago a full-term 7 pound baby delivered by a spontaneous easy labor of two hours' duration. Operation, divulsion, curettage and trachelorrhaphy. Three years later or seven years after first pregnancy delivered of a 7½ pound baby by a long labor of twenty hours due to slow dilatation of cervix which was slightly lacerated.

CASE 3.—Mrs. C., twenty-two years, married four years, two full-term, normal spontaneous labors, last two years ago. Operation, curettage, trachelorrhaphy and removal of urethral caruncle. One subsequent full-term labor referred to by the patient as a "hard slow labor."

NOTE: Thus in the three cases in which previously only normal labors occurred there were subsequent hard labors. This was unquestionably due to a prolonged first stage due to slow dilatation of the cervix. In two a trachelorrhaphy alone was done and in the third a trachelorrhaphy and repair of pelvic floor.

3. *Easy Deliveries in Subsequent Labors.* (17 of 30 full-term deliveries or 56.7 per cent)

CASE 1.—Mrs. M., thirty-two years, married seven years. One full-term labor terminated by a hard instrumental delivery resulting in extensive cervical laceration and complete tear through the sphincter. During early months of her pregnancy the uterus was prolapsed. Subsequently patient had two abortions the last one followed by curettage. Operation, divulsion and curettage, repair of complete laceration of pelvic floor and trachelorrhaphy. Three years later delivered of male child weighing 7 pounds and 14½ ounces. Membranes ruptured spontaneously one hour before pains were established. Duration of labor two hours and thirty minutes.

Hemorrhage, sixteen ounces in amount, immediately after third stage. Inspection revealed a right lateral laceration of the cervix extending up into broad ligament, which necessitated immediate suturing with three chromic gut sutures to control the hemorrhage.

CASES 2 AND 3.—Both of these subsequent normal labors occurred in the same patient. Mrs. C., twenty-six years, married three years. One full-term labor of forty-eight hours' duration, which was terminated by forceps. This was followed by four spontaneous abortions. Operation, trachelorrhaphy, repair of pelvic floor, shortening of round ligaments and appendectomy. In the following five years there were two full-term labors. The first was normal and spontaneous but was followed by relaceration of the cervix. The second was a breech extraction of a 6 pound 2 ounce female baby. Duration of labor, 8 hours and 13 minutes.

NOTE: Of the above three subsequent deliveries the easy and short duration can be accounted for in the first by the relaceration instead of dilatation of the cervix, and the same thing can be said for the first labor of the second case. As to the third case the cervical repair had given away in the previous labor. Therefore it seems to me that there was dystocia due to the trachelorrhaphy.

Five of the remaining cases with instrumental deliveries in previous labors had subsequent easy or normal deliveries as follows: (a) Previous operative delivery, with stillbirth, and subsequent easy labor; (b) previous 27-hour instrumental delivery with subsequent 7- or 8-hour normal labor with relaceration of cervix; (c) previous instrumental delivery with a subsequent easy, normal labor; (d) previous instrumental delivery of 10 hours' duration and a premature, 8 months' baby, with a labor of 1 hour; subsequently a full-term spontaneous delivery of 2 hours' duration; (e) previous instrumental delivery of 24 hours' duration and a second pregnancy ending in an abortion with a subsequent premature delivery at the thirty-seventh week of gestation. Nine of the remainder of the seventeen cases had previous and subsequent normal or easy deliveries but one of these cases should be excluded as there had been a failure of the trachelorrhaphy due to secondary hemorrhage and secondary union.

NOTE: Of the 17 subsequent labors, one a premature following trachelorrhaphy, there is definite information in regard to relaceration in but 7, or 41.1 per cent. However, from this I am inclined to believe that the dystocia may not be apparent but that if all trachelorrhaphy cases were examined after subsequent easy labors, laceration would be more often found.

CONCLUSIONS

1. Amputation of the cervix and trachelorrhaphy are effectual and adequate operations and have a definite place in the gynecology of today.

2. Secondary hemorrhage and secondary union occur more often after trachelorrhaphy and are due rather to faulty technic than infection.

3. Improvement in the general health occurs in over 82 per cent of the cases for each operation but it is greater after amputation of the cervix.

4. Amputation of the cervix is more efficient than trachelorrhaphy in the cure of leucorrhea and dysmenorrhea but is more often the cause of these symptoms in cases previously free of vaginal discharge and menstrual pain.

5. Voluntary sterility is increased by cervical and vaginal plastic operations, but, all things being equal, there is 11 per cent greater sterility after amputation of the cervix than after trachelorrhaphy.

6. Amputation of the cervix is more often than trachelorrhaphy followed by interruption of labor before full term but is no more liable to end in premature labor than trachelorrhaphy. Abortion is more frequent after amputation in proportion to the number of high amputations.

7. Dystocia is greater after trachelorrhaphy both as to the number of operative deliveries and of difficult spontaneous labors.

8. With proper indications and technic, low, or medium amputation is as applicable as trachelorrhaphy to women in the childbearing age.

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DIABETES AND PREGNANCY*

BY JOHN N. BELL, M.D., F.A.C.S., DETROIT, MICH.

THE subject, diabetes and pregnancy, is brought before the Association for discussion in the hope that we may arrive at some more definite conclusions regarding the prognosis and treatment.

INCIDENCE

If we are to judge from what appears in the standard textbooks on obstetrics relative to this subject, pregnancy complicating a true diabetes is a rare condition, Williams in 1909 being able to collect only 66 cases in the medical literature. It is quite conceivable, however, that many cases may have died in coma supposedly uremic, when, in reality, the condition was an unrecognized diabetic coma, since a hyperglycemia may exist with a high renal threshold and no glycosuria. Most textbooks dispose of this subject by stating that it is a very grave complication of pregnancy and give a gruesome picture with a maternal mortality of approximately 30 per cent and a fetal mortality of 50 per cent or higher.

The writer believes these figures, with our present understanding

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and treatment of this condition, must be materially modified, as these percentages were based on the old time treatment of diabetes when no blood chemistry tests were made. It is my purpose to discuss more especially the true diabetes of pregnancy or, perhaps, it might be better to say pregnancy complicating a true diabetes, and to cite two cases occurring in my practice recently in which the outcome illustrates quite clearly the importance of the modern treatment of true diabetes. In order to arrive at a clear understanding of what constitutes a true diabetes in a pregnant woman, a brief discussion of the different types of glycosuria may not be amiss at this time.

Lactosuria, as is well known, is a condition in which milk sugar is found in the urine and is due to resorption of milk from the breasts and its excretion by the kidneys. It can be distinguished from grape sugar by the fact that Fehling's solution can be reduced after the fermentation test has been applied.

Alimentary glycosuria is a condition sometimes called "physiologic glycosuria" where grape sugar is found in the urine especially in the latter months of pregnancy, but the characteristic symptoms of a true diabetes, such as furuncles, pruritus, thirst, etc., are absent. It is due to an excessive ingestion of starches and sweets in the diet and disappears promptly when these are withheld.

Renal diabetes is a condition where there exists: I. A fairly constant glycosuria not affected by carbohydrate intake, thus distinguishing it from alimentary glycosuria. II. Absence of symptoms of diabetes. III. A *normal* blood-sugar content. In these cases glycosuria is more or less constant in each pregnancy, but the sugar disappears promptly from the urine after delivery.

Diabetes mellitus is differentiated from the other types of glycosuria in that a hyperglycemia is present together with the characteristic symptoms of true diabetes—thirst, pruritus, etc., thus distinguishing it from the so-called renal diabetes.

Obviously, therefore, when confronted with a glycosuria in a pregnant woman our first concern should be to determine whether or not we are dealing with a hyperglycemia. This may be done by a careful inquiry into the patient's family and personal history, applying the regular tests for the milder forms of glycosuria and a careful blood-sugar estimation, in order to determine if the renal threshold has been passed and sugar is being poured out in the urine.

If it is found that we have one of the milder forms of glycosuria to deal with, we may rest assured the case will terminate favorably with the ordinary attention to diet, and, in the renal type, an occasional blood ratio test. Should, however, the case prove to be one of hyperglycemia, the question then arises: Shall we terminate the gestation

or attempt to carry the patient to term by instituting the Allen-Joslin treatment or some modification?

I desire to report the two following personal cases, of which the first illustrates a decidedly happy outcome for both mother and child; while in the second, death of the child occurred *in utero* at term.

CASE 1.—Was that of a young woman, age twenty-six, primipara, weighing 140 pounds, apparently in perfect health, five months pregnant, personal history negative, except for childhood diseases. About the sixth month of her gestation she developed a glycosuria. On careful inquiry it was found that her father was a diabetic and that the patient had shown a trace of sugar in her urine when about seventeen years of age. This, however, had disappeared and she was in excellent health up to the time of her marriage. The glycosuria did not respond readily to the withholding of the carbohydrates and she was placed in the hospital under the care of a competent internist.

Unfortunately the blood-sugar ratio was not determined until she had been three days in the hospital. It was then .165 per cent. Following three days' starvation treatment the glycosuria dropped from a 4+ to 1+ and on the twelfth day the blood sugar was .12 per cent. After about three weeks green vegetable and fat treatment with an occasional allowance of oatmeal, she reached a tolerance of 1333 calories and was allowed to go home, but was requested to report daily the condition of her urine and to adhere rigidly to the modified diet. She entered the hospital again at term feeling perfectly well, with a trace of sugar in the urine and a 2+ albumin. Blood sugar .15 per cent. Labor was induced by the administration of 1½ ounces of castor oil. She was delivered under gas-oxygen anesthesia, low forceps and mediolateral episiotomy. At no time after delivery did she show any signs of coma and both mother and child made a normal recovery, except that the mother has a persistent mucoid vaginal discharge which resists all treatment. The urine (5 months after delivery) is free from sugar and she has lost about 10 pounds in weight. At birth, the baby's blood and urine were negative for sugar and now, at five months, she is a perfectly normal child. It seems fair to presume this to be a case of pregnancy complicating a mild diabetes mellitus. This patient had shown grape sugar in the urine prior to her marriage and there may have been an inherited tendency toward diabetes; her father being a true diabetic for many years.

The favorable outcome in this case, I am inclined to believe, was due to careful supervision and modern treatment. The case is reported with the hope that obstetricians may be led to take a more optimistic view of this complication of pregnancy and report their experiences, so that in the future we may be able to have sufficient data on which to base a more definite and encouraging prognosis. It will be noted on referring to the accompanying chart that the urine sugar was + when the blood sugar was .165 and did not decrease when the blood sugar was .12, thus suggesting a low renal threshold.

CASE 2.—Is quite another picture. A primipara, age thirty-seven, weighing 180 pounds, of full habit, consulted me in her eighth month of gestation; she gave a negative history, except for childhood diseases. Urine free from sugar and albumin up to within three weeks of term, at which time she developed a trace of sugar. Supposing it to be an alimentary glycosuria, I placed her on a restricted diet, eliminating the carbohydrates. She responded promptly, and the next specimen of urine was free from sugar. She remained on the restricted diet, but one week before term the sugar reappeared in the urine. A blood sugar estimation was now made and it was found she had a mild hyperglycemia, 138 mg. to the 100 c.c. Her urine at this time showed .432 per cent sugar. Patient felt perfectly well; the child was

CHART OF CASE 1.

DATE	URINALYSIS						BLOOD CHEMISTRY						DIET			
	C.C. VOL.	SP.GR.	REACT.	ALB.	SUGAR	GR. NH_3	SUGAR	N.C.N.	URIC	FAT	WGT.	B.P.	CARB.	PROT.	FAT	CALOR
1- 8-21		1018	Alk.	Tr.	****							124/76	House diet			
1- 9-21		1020	Ampho	–	***						142		Starvation			
1-10-21		1020	Acid	–	**	.25							Starvation			
1-11-21		1018	Acid	–	*		.165	25	4.3	.857	138¼		5%	23	18	285
1-12-21		1019	Acid	–	*(–)	.46							10.5	31.5	29	420
1-16-21	1200	1017	Acid	–	*						140¼		72.5	57	29	775
1-17-21	1140	1020	Acid	–	**	.32							72.5	57	29	775
1-21-21	1560	1019	Acid	–	*	.44	.12	20					72.5	57	29	775
1-23-21	1140	1018	Acid	–	*	.46					139¾		64	50.5	52	915
1-27-21	1860	1020	Acid	–	**								70	60	70	1133
1-29-21	2220	1016	Acid	–	**								70	69.5	80	1260
1-30-21	2460	1013	Acid	–	**	.24					138¼		65	70	90	1333
2- 1-21	1890	1014	Acid	–	–								65	70	90	1333
2- 2-21	1900	1014	Acid	–	–								65	70	90	1333
							Return to Hospital									
4-20-21								20				120/87	77	38	24	674
4-22-21	360	1012	Acid	**	*		.15	Day following delivery					64	26	20	540
4-27-21		1020		**	Trace		.15	21		.70		140/90	74	58	73	1183
5- 1-21	1024	1020	Acid	–	–								66	45	96	1330
5- 4-21	1728	1020	Acid	–	Trace	.38							74	53	102	1420
5- 6-21	1696	1020	Acid	–	Trace	.21			Home				89	74	92	1615

Delivery—Gas Oxygen—Low Forceps—Medio-lateral episiotomy. Baby's urine neg. for sugar.

living and active. She reported again at term, feeling in the best of spirits, but on auscultation and palpation it was found the child was dead *in utero*. Labor was induced with Voorhees' bag, the patient making an uninterrupted recovery. The urine still shows a marked trace of sugar. On more careful inquiry into her history before marriage it was found that she had, at times, been troubled with a vulvar pruritus and thirst; but she had never consulted a physician.

This case, I believe to have been one of a long standing mild hyperglycemia with a high renal threshold as it was an easy matter to render the urine free from sugar by simply withholding the carbohydrates, and a more favorable outcome might have resulted had the true condition been determined and proper treatment instituted earlier in her pregnancy.

In conclusion permit me to suggest: 1. That a more careful prenatal history be taken in all obstetric patients. 2. That a blood-sugar estimation be made in all cases in which symptoms of diabetes are present regardless of the presence or absence of glycosuria. 3. That a fair trial of the newer forms of treatment of diabetes be instituted before terminating the pregnancy.

The writer is indebted and deeply grateful to Dr. O. C. Foster, Chief Resident in Obstetrics, Harper Hospital, for valuable assistance in the preparation of this paper.

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HEART DISEASE IN PREGNANCY*

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JUST as the examination of thousands of men for the army revealed, as never before, the presence of heart murmurs that did not mean organic disease of the heart, so the careful examination of women during pregnancy shows that many women have or are developing murmurs which are not dependent on heart lesions.

There are certain changes that take place within the heart and circulation during pregnancy which are familiar to all: In the early months, the quickening of the pulse; by the sixth month, the shortness of breath on exertion; and by the seventh or eighth month, the encroachment of the enlarging uterus upon the diaphragm alters the shape of the chest, broadens it out at the lower rib edge, and with the widening of the chest circumference, the heart is displaced upwards, frequently to an inch beyond the nipple line, and the apex is pushed up to the fourth interspace. At this period, also, the pressure of the heavy uterus sometimes gives rise to more or less extensive edema and varicosities of the legs. Formerly we were taught that the heart hypertrophied during pregnancy; but more careful observations and study with x-rays disprove this.

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With all these changes there arise physiologic or functional murmurs in 40 per cent of pregnant women; and, unless properly interpreted, they may lead to undue anxiety on the part of the physician and, consequently, unwise advice to the patient. No cardiac irregularity or murmur is, of itself, an evidence of heart disease.

Newell states that valvular lesions, the result of chronic endocarditis, can be demonstrated in from 1.5 to 2.5 per cent of all pregnant women, the percentage varying according to the interpretation put upon the presence of murmurs.

The mortality from the various heart lesions differs greatly: Mitral stenosis gives the highest mortality, 50 per cent; uncompensated aortic disease, which is rare in pregnancy, 25 per cent; while mitral regurgitation, with no previous break in compensation, shows an almost negligible mortality under proper care in young and vigorous patients. However, the actual mortality does not tell the whole story in these cases with true organic lesions; for, whereas the patient may survive the pregnancy and labor, the extra strain thrown upon the heart during gestation, is often the beginning of years of invalidism, or the heart is left so crippled that the patient succumbs to later intercurrent disease from which she otherwise might have recovered.

An acute endocarditis arises rarely in pregnancy as the result of some septic process, such as acute articular rheumatism, influenza, tonsillitis, or other infectious disease; but when it does occur, it is always a serious complication; occurring late in pregnancy it may prove fatal; or, if it happens early, will lead to an abortion. Late in pregnancy, as a result of toxemia, an acute dilatation of the right heart may take place, where in addition to the increased blood pressure and albuminuria, there are added edema of the lungs, cyanosis, and valvular murmurs.

In a recent case, seen in consultation, this condition occurred and the patient, at the time, was *in extremis*. She weighed 230 pounds, had a blood pressure of 160, pulse was irregular and rapid; she was unable to lie down for the previous two weeks; she was cyanosed and gasping for breath. A cesarean section was quickly performed under gas and oxygen, with the patient in a semireclining position. A living child was delivered. The mother was in a critical condition for several weeks, but ultimately made a good recovery. She now does her usual work and no murmur can be heard.

More frequently there come to us patients with a history of a heart murmur, or some form of heart trouble, the result of a previous infection. Every one of these cases requires the most painstaking examination, along lines that will later be explained, to determine the efficiency of the heart and the actual condition present. In taking the history of every obstetrical patient, careful inquiry should be made

as to any past infection which may have damaged the heart valves or muscle, and yet show no symptoms during ordinary life, but which might give rise to symptoms later under the burden of pregnancy and labor. Pregnancy imposes more work on the heart in maintaining the placental and the general circulation against the increased intraabdominal pressure and the augmented body weight (20 to 50 pounds), which the ordinary patient puts on during gestation. It is this which reveals the myocardial inefficiency during the later months of pregnancy.

Patients with a history of heart murmur or cardiac disease, come to consult us, occasionally, as to the advisability of marriage and childbearing; but more frequently they come after marriage, already pregnant, and with a history of previous heart trouble. Even when they have consulted a physician as to childbearing, they are often ill advised; the physician making only a cursory examination, not appreciating all the dangers ahead in certain lesions. A case, now under observation, came after the fourth month of pregnancy with beginning decompensation from mitral stenosis; yet, she had been advised that she might have two or three children if she so desired.

One should remember that a sound heart may have a murmur; it may be physiologic or functional and, therefore, innocent; but it is important for the patient's peace of mind, as well as our own, that we carefully differentiate the harmless from the dangerous murmurs. The significance of a murmur is based on the functional efficiency of the heart and on the presence or absence of other symptoms of cardiac disturbance. Detection of a mitral systolic murmur or any other murmur, a mitral being the most frequent, should cause us to consider carefully the pulse rate, its rhythm, and the size of the heart; if the response of the heart to effort is good and the size of the heart is not increased, then the murmur is of no significance; and if the heart is enlarged and there is good response to effort, then pregnancy may be allowed. If the heart is hypertrophied and the response to effort is limited, pregnancy requires most careful watching. If there is any question in regard to the advice that should be given, a competent heart specialist should be consulted.

Physiological heart murmurs, according to MacKenzie, are always systolic in time, and it is impossible to tell the origin of most of them; they may be louder at the apex, base, or midsternum, and may vary with respiration or posture; sometimes they are heard when lying down and disappear when rising, or *vice versa*. As a rule functional murmurs are systolic in time and are heard with equal clearness over different parts of the heart. The murmur is usually soft and blowing; there is no accentuation of the second pulmonic sound; they may increase or decrease during pregnancy, or may come and go.

A rough murmur, especially if accompanied by a purring tremor or a musical note, is indicative of a valve lesion; the transmission of the murmur is important; in actual organic murmurs, the smaller the leak, the louder the murmur. Bearing all these things in mind, the physician, in advising a cardiopath as to marriage and childbearing, should make certain that the heart is defective and should then endeavor to determine the efficiency of the heart. Every case of heart disease should be painstakingly studied and treated on its own merits.

Burckhardt and others have called attention to the importance of a continuously low blood pressure, or pulse pressure, as a symptom of an inefficient heart muscle; a muscle that is able to meet the demands of ordinary life, may give way under the strain of labor.

Webster has said that it is a safe generalization that a woman with a chronic cardiac lesion, i.e., valvular or myocardial degeneration has, *ceteris paribus*, a shorter life expectancy if she becomes pregnant than if she does not, and the risk increases with successive pregnancies. One sees, occasionally, a patient with a definite organic heart lesion go through one, or several, pregnancies with no more discomfort than the average patient.

Heart failure is a question of myocardial efficiency. The force of the heart is of two kinds, rest and reserve force. The former is the force of the heart when the individual is at rest; the reserve force is called into play when effort is made. Heart failure begins by a diminution of the reserve force, and shows itself by a limitation of the power of the heart to respond to effort. The first sign of heart failure is the patient's consciousness that efforts, formerly made with ease and comfort, now cause distress. As has been said above, during pregnancy a healthy heart may show such a symptom from the burden of pregnancy, the encroachment of the uterus upon the diaphragm, the increased body weight, etc.; but, usually, there is not much danger, unless there is some previously unrecognized myocarditis. But this symptom, when due to heart failure, does not subside as quickly as when the heart is normal.

In beginning heart failure from organic disease the patient is apt to notice first, as MacKenzie puts it, "breathlessness with its associated phenomena in consequence of the stimulation of the respiratory reflex, and she complains next of pain and its associated phenomena in consequence of exhaustion of the heart muscle." The breathlessness is due to the failure of the heart to supply sufficient blood to the respiratory center, while the pain is due to the insufficient blood supply to the heart muscle.

Any woman who has suffered from these two symptoms during ordinary life should be advised against childbearing; or, if pregnant, it is advisable to empty the uterus early in most instances, otherwise

she will more than likely abort, and her heart will be left in still worse condition; or, if allowed to go on, and decompensation occurs, she is apt to lose her life.

If a patient with definite heart lesion has never had failure of compensation, and if her age is such that she is apt to have good recuperative powers in the event of possible decompensation, and if the lesion is a mitral regurgitation and not a stenosis, she may be permitted to become pregnant, or, if pregnant, may be allowed to continue; but she should be told the whole story of the importance of taking care of herself and of keeping under careful supervision, not only throughout the pregnancy, but for some time thereafter. Therefore, the valvular lesions of themselves do not constitute a bar to pregnancy, but rather the manner in which the circulation is and has been maintained.

Every patient with a history of cardiac trouble should be most painstakingly examined before and after exercise; she should also be examined in the morning after a night's rest before rising, so as to determine whether there are signs of passive congestion at the base of the lung on the side upon which she has been lying. If there are some suberepitant râles audible in this region, and these râles disappear after one or two deep inspirations, they are of no significance; but if the râles persist, and there is a change in the percussion note of that side, it is an evidence of inefficient heart muscle, and pregnancy should be forbidden, or, if present, it should be interrupted. Many heart cases will do fairly well until the sixth or seventh month of pregnancy; then, when digestive disturbances and abdominal distention give rise to pressure, or toxic symptoms set in, the heart is embarrassed.

Other factors also enter into the question of allowing pregnancy, or the continuation of a pregnancy, in these cases. As intimated above, the valve involved and the condition of the heart muscle are of importance; also the patient's general health, habits, and social status must be considered in determining the course to be pursued.

If the patient is poor and unable to have sufficient help with her work, or if she has other children to care for, the strain of pregnancy will be greater than if she is able to enjoy ease and comfort. One of the greatest difficulties with which the physician has to contend, is to make cardiopaths realize that they are cripples, more so than if they were minus a leg and compelled to use a crutch or cane. Because the symptoms are more or less subjective, they do not appreciate that they come from overtaxing the heart, and so are rebellious at the restrictions we put on their efforts.

During pregnancy a cardiopath requires more careful watching than a normal case, for the patient is more prone to toxemia and the

digestive functions are more easily disturbed; she requires plenty of fresh air, a restricted diet, and most careful supervision of bodily exercise, so that she may not overtax her heart. One must be ever on the alert, especially in the later months of pregnancy, for the first symptoms of impending heart failure. If inefficiency of the heart muscle is evident, the patient should at once be put to bed and every effort made to restore the circulation. If the pulse rate is much increased digitalis in sufficient dosage to slow the pulse should be given. In auricular fibrillation the best results are obtained from digitalis, for here the heart failure is associated with rapid pulse rate, and many of the beats are inefficient.

While digitalis slows the heart, the individual beats are stronger and more effective. One should give sufficient dosage to obtain results. In a recent case one dose of 60 minims was given, followed by 30 minims every three hours until the pulse fell to 80, and was then stopped on account of nausea, to be resumed as soon as possible in smaller doses. Usually, one needs to give only 15 to 20 minims every three or four hours, for from four to seven days, to bring the pulse down to 60 or 70 per minute. Symptoms of overdose of digitalis are nausea, vomiting, and diarrhea, with a feeling of tightness across the chest and a drop in the pulse rate. Patients should avoid everything that might throw a strain on the heart, like mental worry, straining at stool, digestive disturbances, etc. They should also have small frequent meals, and mild hypnotics for sleep, if needed.

The course for further action, must depend on the period of pregnancy and whether there is a history of past broken compensation. If early in pregnancy, as soon as compensation has been reestablished the uterus should be emptied, unless the heart responds promptly to treatment. If the patient realizes the risk of continuing the pregnancy and can take the best of care of herself, and is willing to take the chance, then pregnancy may be allowed to continue, though frequently the child is lost anyhow through prematurity. If there is a history of previous decompensation, the outlook for going through the pregnancy safely is bad. If the lesion is a mitral stenosis or a chronic myocarditis, the chances of the heart bearing the strain of the later months of pregnancy and labor is small. In mitral stenosis the termination of pregnancy is indicated when edema of the lungs persists in spite of sitting up in bed, or if the pulse remains over 100 with palpitation on effort.

As stated above, mitral stenosis is the most serious heart lesion; it is usually due to rheumatic endocarditis, and is not often noticed during the acute stage of the illness, because the stenosis does not begin until cicatrization has narrowed the orifice, and because the lesion is progressive.

If in any heart lesion decompensation occurs late in pregnancy, and if, by careful treatment and nursing, there is hope of securing a viable child, pregnancy may be allowed to continue; but as soon as labor begins, everything must be done to reduce muscular strain. The treatment to be adopted will depend upon whether the patient is a primipara or a multipara, the condition of cervix and perineum, and the size of the child. If she be a primipara, a cesarean section will prove the best procedure. When heart failure is so pronounced as to threaten life, immediate intervention is necessary. If premature labor does not set in, and even this is dangerous, a prompt hysterotomy will often save the life of both mother and child. In these extreme cases the heart failure is shown by the dropsy, enlarged liver, edema at the base of the lungs, and cyanosis. Each day the pregnancy continues is fraught with danger. The patient's condition is desperate whether the pregnancy continues or not.

Ether is not a safe anesthetic. One should choose between gas and oxygen or a local anesthetic, as advocated by Webster. In any case in which a cesarean is done, sterilization should be performed to prevent subsequent pregnancy. In a case with a definite heart lesion, without broken compensation, one must realize that labor may bring on heart failure, and labor must be so conducted as to save the heart in every way. Morphine and scopolamine should be given during the first stage to quiet the patient and assist in dilatation of the os. As soon as the cervix is dilated or dilatable, a version should be performed, or the forceps applied, to shorten the second stage.

Death of the mother may occur after the delivery of the child, or during or after the third stage of labor, from the change in the intra-abdominal pressure and consequent overdistention of the right heart. To forestall this, some have advised the gradual removal of the placenta, thus allowing a rather free loss of blood. Unless the loss of blood is too free, one should avoid the use of pituitrin and ergot. The use of sandbags weighing from 25 to 50 pounds has been advocated in order to maintain the intraabdominal pressure; but, at all events, a tight abdominal binder and compress should be applied and the patient most carefully watched after she is returned to bed.

During the puerperium prolonged rest in bed, with appropriate medication, is indicated. The patient's activities for weeks must be carefully supervised. The question of nursing the child will be determined by the patient's general condition, especially the condition of the heart and her natural recuperative powers. Patients who have gone through with no break in compensation are usually able to nurse, while those who have had decompensation will be better off when relieved of this added strain.

CONCLUSIONS

During pregnancy no cardiac murmur or irregularity is of itself an evidence of heart disease.

Pregnancy lessens the life expectancy of any woman with a chronic valvular or muscular lesion.

Valvular lesions of themselves do not constitute a bar to pregnancy; but the manner in which the heart does its work is all important.

Every cardiopath is a cripple, and her treatment throughout pregnancy and labor must be such as to spare the heart in every way.

Cesarean section gives the best results in uncompensated cases and in those cases where heart failure threatens during labor.

240 Michigan Street. (*For discussion, see p.* 78.)

THE BREAST PHYSIOLOGICALLY AND PATHOLOGICALLY CONSIDERED WITH RELATION TO BLEEDING FROM THE NIPPLE*

By Gordon K. Dickinson, M.D., F.A.C.S., Jersey City, N. J.

THE breast is the most restless and susceptible of organs, being influenced by hormones, toxins and the psyche, intended by Nature to functionate in a cycle as a secondary sexual organ. It is composed of converted dermal basal cells, supported by a soft hyaline connective tissue.[1]

Hyperemia is induced monthly by the ovarian secretion, and, if pregnancy ensues, the hormones, sent out from the placenta, activate the gland to further growth[2] and the formation of colostrum, which has, according to Robertson,[3] the same effect when reabsorbed as the secretion of the hypophysis, determining the time of labor. With weaning, the breast returns to a quiescent state, but not as before.

It might be said that the breast yearns for normal function, that every bosom will tend to pathologic states of the tumor type, as will also the uterus and ovary, if the natural cycle be interfered with. If, perchance, abortion occurs, particularly the self-induced, the tissues of the breast are shocked, and a woman who has suffered repeated abortions has a breast more prone to the formation of tumors with malignant tendencies, for she who suppresses or defies Nature is penalized.[4]

In certain people suppression of the menstrual flow may produce an active congestion of the breasts with pain, tenderness, and sometimes bleeding. In my early practice I can recollect a woman, well

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nourished, and not of the neurotic type, whose flow was suppressed for some unknown reason. Her bosoms were large, overhanging, and there was excoriation of the skin underneath. At the time she should menstruate there would be an oozing of blood from this excoriation and, occasionally, a discharge of blood from the nipple. After a year or so the menses were reestablished and the phenomenon ceased. This case was in the dim past when notes were not taken, but the mental recollection is, I think, accurate. Literature ascribes to dysmenorrhœa the same condition of bleeding, which we believe to be a fiction.

It is recorded that there is also a response in conditions of metritis, parametritis, and ovarian tumors. Lane[5] claims that the breast, particularly the upper outer lobe, will harden when there is present what he calls "fecal blood." Lockwood[6] has had a similar condition in a case of infective vaginitis and another in cholecystitis, the hyperplastic process in the bosom disappearing with relief of these conditions.

The instability of the breast is also seen as the woman ages, the breast of puberty passing over to the full-formed condition of adolescent life, then with menopause there is recession, more or less complete, with increased tendency towards pathologic changes. With the psychic states of love and its expressions in prolonged courtship, the breast often responds with alteration in its tissue substance. So we see that this organ responds, normally and abnormally, to diverse conditions with a low margin of normality.

Before thirty-five years of age the most common tumor found in the breast is the fibroid, which is an overgrowth of the hyaline connective tissue, discreet, movable under the skin and, occasionally, accompanied by slight but sharp pain. It is considered benign. We have had one case in which its irritation was sufficient to produce a bloody discharge from the nipple. These fibromas sometimes seem to be neuropathic, for we have known them to disappear when the exciting cause, psychopathic or otherwise, passed away. They then soften and become a natural part of the bosom.

After thirty-five years of age, the fibrous tissue grows into and includes areas of the breast substance. These tumors are in the periphery, often slightly tender, occasionally associated with pain, and if they remain benign, they are not apt to grow. In a somewhat larger percentage of cases than the fibroid, irritation and hyperemia are sufficient to produce a blood-stained discharge. We have had several instances of this.

Occasionally the lining of the ducts will proliferate and form papillomas. They are always well supplied with blood and the normal movements of the breast will rub off the surface and produce hemorrhage. This type of growth is the most common cause of bleeding from the nipple. It is to the duct what warts are to the skin, and may

exist for many years, bleeding without becoming malignant. According to Bloodgood,[7] it would be inferred that the tendency to malignancy is slight enough not to be seriously considered, while Rodman[8] claims the dangers of malignant changes are great. We have had a number of cases of this type, and, in the majority of them, the microscope has shown that the cells at the base had begun to wander and other evidences of malignancy were demonstrable.

Sometimes the ducts will become occluded by constriction and distended with a clear serous fluid. It is often difficult to differentiate between a cyst and a fibroadenoma. Tapping will establish a diagnosis. These cysts are prone, however, to have small papillomas on the surface which, not being rubbed or irritated, are not given to hemorrhages. They possess the same tendency to malignancy as the first-mentioned type, which occurs nearer the nipple.

It is now believed by pathologists that tumor formation in the mammae is a type of chronic inflammation. We know that the breast excretes germs from the blood and also that germs can pass up through the ducts of the nipple and into the tissues of the breast. We have referred to the findings of Lockwood, where vaginitis and cholecystitis were associated with temporary hyperplasia of the mammary substances. Lane's investigations also tend to confirm this.

Curiously, the upper outer lobe, the left one in particular, is the portion more apt to be hardened and multicystic and the site of chronic interstitial change which, eventually, passes through the bosom and is known as chronic cystic mastitis. Why this particular lobe should be selected cannot be explained on embryonal or histologic grounds; but it seems to us possible that there is some correlation with the long-lost axillary breast, which comparative anatomy shows once existed, and which we now find occasionally as an anomaly; that the forces which led to the disappearance of this gland are acting upon the lobe which extended out toward it. This may be an idle opinion of the writer, nevertheless, it is the portion of the breast first affected. If we can discover and eliminate the cause, we may have recovery; if not, we have tissue changes where the basal cells are prone to go wild, lose their centresomes, undergo active mytosis irregularly, and escape through the poorly resisting hyaline connective tissue and develop carcinoma. Applegate[9] claims carcinoma is preceded by abnormal involution.

The wandering cell acts very much as a parasite, producing local inflammatory reaction, with formation of fibrous tissue. If the glandular substance be in excess, we have a soft cancer; if the fibrous, the scirrhus type, both equally malignant. We have noted hemorrhages from the nipple in both soft and hard types, but the blood is

always mixed with serum so that the discharge is more sanious than bloody.

We feel that gratitude should be extended to the pathologists for the work done in the study of the breast; but, like all specialists, from a clinical viewpoint they have exceeded themselves in nomenclature, obscuring the clinical condition by the various names given to each pathologic stage. Not until Warren,[10] in 1905, simplified the classification of tumors was the clinician and the average surgeon able to grasp the subject intelligently. The register of the American College of Surgeons includes the names of several thousands of this cult, and we fear some may not think in terms of pathology; therefore, if we are to fight cancer and comprehend so-called precancerous conditions or, better stated, conditions which often develop into or are followed by carcinoma, we should give to those who operate a ready means for diagnosis by simplifying terminology.

Every surgeon hesitates to mutilate a woman, and particularly this organ, but every surgeon with a conscience will attack that which is or may become cancer. Benign means "born good," but all tumors of the breast, which have this title, are apt to go bad and are not to be trusted. As to their innocence there is no reliable sign or symptom. Bleeding from the nipple we see associated with them all at times, as well as with functional conditions, and we cannot always tell by naked eye appearances what we may find after removal. Sad experience has taught us to be prompt and thorough in operation.

Neither is there a reliable sign as to malignancy or beginning malignancy. The benign condition is apt to be but temporary. We see that blood coming from the nipple is neither diagnostic nor prognostic. We know from experience that the touch cannot differentiate between adenoma and beginning carcinoma. For frank malignancy Dr. Willy Meyer, in 1894, gave us a technic which has satisfied the time test; but for tumors only "born good," we have not as yet a definite plan of attack. Some surgeons resect in part; some do a complete plastic subcutaneous resection, and others a radical removal. Can we today say who does wisely?

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280 MONTGOMERY STREET. (*For discussion, see p. 78.*)

THE SLAUGHTER OF THE INNOCENTS*

By Palmer Findley, M.D., Omaha, Neb.

THE medical profession would do well to consider, seriously, some of the phases of the subject of criminal abortion. We should know what constitutes a criminal abortion in contradistinction to therapeutic abortion; we should inquire as to the extent of this nefarious practice; we should ask ourselves who are the offending parties; we should know how best to protect ourselves against unjust accusation when called upon to treat these cases after they have passed from the hands of the abortionist; and, finally, we should inquire into the responsibility of the profession in view of the widespread prevalence of this social plague.

The civil law clearly recognizes the right to interrupt pregnancy before the period of viability when the life of the mother is jeopardized by the continuation of pregnancy. To interrupt pregnancy prior to the period of viability for any reason other than to safeguard the life of the mother is a moral, ethical and legal crime. Yet in spite of all civil and ecclesiastical law this heinous crime has stealthily increased from the dawn of civilization to the present time.

We are told that one in five or six pregnancies ends in abortion, and that 50 per cent of all abortions are criminal. It has been estimated that in New York City alone there are 80,000 criminal abortions annually. The practice exists in all parts of the globe and infests all grades of society. Indeed, it would appear that this social plague is more prevalent in the higher classes of society. Women of keen moral sensibilities either commit the act themselves or seek aid from others with little knowledge of the dangers involved and with conscience undisturbed. This is so because of ignorance. They know little of the pitfalls involved in the undertaking and they are possessed of the sentiment, prevalent among the laity, that there can be no life until fetal movements are felt. To illustrate how difficult it is to convince the lay public that life begins at the moment of impregnation, the eminent German naturalist, Ernest Haeckel, relates how he once made this assertion to an eminent jurist only to be laughed at. We often find women of unquestioned moral standing bitterly resenting their state of pregnancy, and who are determined to put an end to the whole affair; yet, when the date of quickening arrives and they are conscious of sheltering and nourishing a human life, their viewpoint

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is completely changed, and from that moment to the date of birth they live in happy expectation.

But what of the professional abortionist who, for a few paltry dollars, will destroy a potential human life and place the life and health of a mother in grave danger? The woman abortionist, who plies her trade under the guise of a midwife, the charlatan, who covertly or openly advertises in the daily press, and the physician of high or low degree, who prostitutes his profession, all alike ply their nefarious trade unabashed and unrestrained; for not one in a thousand is ever held accountable for the crimes he commits. This is largely because of the technical difficulties in getting evidence admitted in the courts; partly because of embarrassment to any individual in filing a complaint, but more than anything else, because organized medical associations have not taken definite and determined steps to rid the profession of these criminals and to educate the lay public in the dangers involved in the practice of committing abortions. Lombrosa, the great criminologist, says that "abortions in the United States have become so common that, instead of being regarded as a crime, it is a laudable and justifiable means of limiting the size of families." And Lyons says: "if concerted action be taken against these men by the profession at large the evil might easily be overcome. The most of them are arrant cowards and as soon as they realize that men of undoubted professional reputation and standing are determined that they should cease plying their nefarious calling, they will stop." Be that as it may, we must admit that the profession assumes a grave responsibility when this most universal of crimes receives from its hands little more than passive condemnation. If we are to merit the respect and confidence imposed in our profession, a determined campaign should be inaugurated by our medical organizations to the end that the ignorant may be enlightened and offenders within our ranks be brought to the bar of justice. It is futile for the profession to transfer the responsibility to our civil authorities and it is not fair to assume that it is the business of individual members of the profession to handle the situation. The civil authorities may be depended upon to do their part, and the individual member of the profession, however courageous, will find little encouragement and much embarrassment if he fights alone. The individual may be charged with ulterior motives but, when action is taken by an organized medical association of the dignity of our state and county medical societies, the affair becomes impersonal and cannot fail to impress the public and the courts with the seriousness of the charge.

Because of the grave responsibility imposed upon the induction of abortion, it is provided that one or more consulting physicians shall be employed and shall agree upon the indication for the interruption of pregnancy. This is wise not only in the interest of the patient, but

for the protection of the physician on whom the responsibility rests. But what are the safeguards to be established to protect the physician who is called to attend a woman on whom a criminal abortion has been done and who may be in a critical condition? The position of the physician in these cases is disagreeable; it is embarrassing and may prove disastrous to him if he fails to fortify himself with moral safeguards. He is charged with the double responsibility of doing all that can be done for his patient and of protecting himself against unjust accusation. He cannot afford to disregard the gossip, neither should he fail to protect himself against the real offender who would eagerly embrace the opportunity of shifting the responsibility for the misdeed. To this end, it would be a good rule, in such cases, to call a consultant for the initial examination and to witness the statement of the patient. The statement of the patient should best be in writing and should comprise a recital of her known condition prior to the abortion; when the operation was performed; where it was performed; how it was done, and by whom. If the patient is unwilling to divulge this information, then the physician would be justified in declining to assume the responsibility of the case. It is common experience that the patient will tell all she knows when made to realize her danger and a double purpose is attained—the physician in charge is protected and the guilty party is revealed.

BRANDEIS THEATRE BUILDING. (*For discussion, see p.* 81.)

LEGAL ASPECT OF ABORTION*

BY ERNEST F. OAKLEY, JR., PROSECUTING ATTORNEY, ST. LOUIS, MO.

IT IS my desire at the outset to express to your Association the appreciation I entertain in accepting the honor you conferred by inviting me to address you. My subject as assigned is "The Legal Aspect of Abortion." Much has been written and still more will be contributed by pens mightier than mine on the several phases of this subject, approaching as it does, in my opinion, more intimately into the everyday practice of the physician and surgeon than any other single element of the ethics which guide you. I say, "In my opinion," and I might add that my opinion is based on experience acquired while an assistant State's attorney assigned to the office of the Coroner of the City of St. Louis; I formed the conviction that the majority of medical men are strongly imbued with the principles of the ethics of their profession, but I was impressed, however, with their lack of practical application of the principles of ethics, due, not to their desire

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to thwart the administration of justice, but rather to their professional hesitancy to divulge, under any conditions, matters between themselves and their clients, which they held sacredly privileged.

There has existed the necessity of informing your profession in this regard, to the end that greater cooperation may exist between you and the law-enforcement officials. To what extent you are privileged and what is your particular duty under the circumstances of a case presenting evidence of abortion, I shall endeavor to present the legal side.

State v. Shields, 230 Mo. 9, defines abortion as the delivery or expulsion of the human fetus prematurely or before it is yet capable of sustaining life. The same case is authority that the terms "abortion" and "miscarriage" do not of themselves import a crime.

Abortion has been made a crime by statute. At common law it was generally recognized as no offense to produce an abortion on a woman with her consent and before she was quick with child. It was not even murder at common law to take the life of the child at any period of gestation, even in the act of delivery. Today the several states have enacted laws holding the commission of an abortion a felony and punishable as such. The reason is obvious. Regardless of the law and the attendant opprobrium and ruin of exposure, abortion in its unlawful sense is practiced extensively in our country. It is with regret and an expression of condolence to the great majority of your profession, that I state the abominable and nefarious practice is not confined to those outside your ranks. There are renegades among you—as indeed exist in all circles—who for one motive or another, lend their skill to the commission of this crime.

The Statute of Missouri may be taken as a fair example of the law of the several states on the subject, and I quote and discuss Section 3239, Revised Statutes of Missouri, 1919.

"Sec. 3239. Manslaughter—producing miscarriage. Any person who, with intent to produce or promote a miscarriage or abortion, advises, gives, sells or administers to a woman (whether actually pregnant or not), or who, with such intent, procures or causes her to take, any drug, medicine or article, or uses upon her, or advises to or for her the use of, any instrument or other method or device to procure a miscarriage or abortion (unless the same is necessary to preserve her life or that of an unborn child, or if such person is not a duly licensed physician, unless the said act has been advised by a duly licensed physician to be necessary for such a purpose) shall in event of the death of said woman, or any quick child, whereof she may be pregnant, being thereby occasioned, upon conviction be adjudged guilty of manslaughter, and punished accordingly; and in case no such death ensue, such person shall be guilty of the felony of abortion, and upon conviction be punished by imprisonment in the penitentiary not less than three years nor more than five years, or by imprisonment in jail not exceeding one year or by fine not exceeding one thousand dollars, or by both such fine and imprisonment; and any practitioner of medicine or surgery, upon conviction of any such offense, as is above defined, shall be subject to have his license or authority to practice his profession as physician or surgeon in the state of Missouri revoked, by the state board of health in its discretion."

You will note that the gravamen of the offense is the intent to produce a miscarriage or abortion by administering drugs or using instruments. Also that the acts included within the statute coupled with the intent, constitute the offense. That when either the woman or quick child dies, the party responsible is chargeable with manslaughter. That when neither dies, the crime is designated "Felony of Abortion." The punishment in the former ranges from two to ten years in the penitentiary; in the latter, from three to five years in the penitentiary. In either case, the act is a crime whether the woman is pregnant or not, and in either case, the intent to produce miscarriage or abortion must be present.

The exceptions are where it can be shown beyond a reasonable doubt that the abortion was necessary to preserve the life of the expectant mother or unborn child; (a prima facie case of nonnecessity is complete by proof of the fact that the woman was in good health or her ordinary condition of health immediately prior to the abortion); or where the act has been so advised by a duly licensed physician. To this extent, is abortion as such, lawful, and would seem to be the rule generally. The moment the womb is instinct with embryo life and gestation has begun, the crime may be committed.

A Texas case in agreement with the Missouri law, holds that it is not necessary that the means employed should produce the effect desired. A physician's testimony is sufficient to show that the means employed are capable of producing an abortion. Cave v. State, 33 Texas Crim. 335.

A New Jersey case holds in point that the intent to produce the abortion may be present without knowledge or even strong belief that the woman is pregnant. State v. Poe, 48 N. J. Law 34.

Should the woman recover, she is a competent witness against the accused. In the event of her death, her dying declaration is equally competent. In State v. Stapp, 246 Mo. 338, defendant asked for an instruction to the effect that the fact that the prosecuting witness was implicated in the alleged transaction, be taken into consideration by the jury in determining the credibility to be given her testimony. The refusal of the trial court was one of the assignments of error. The Appellate Court held this instruction should not have been given, considering such an instruction useless, containing no legal proposition, and purely a comment on the evidence.

In this connection, Bishop on Statutory Crime declares:

"An accomplice swears under the temptation of earning thereby his own immunity, while the witness does not. She discloses her own disgrace, and where no evil motive appears for it, this fact may in reason strengthen her credibility."

State v. Jones, 197 S. W. (Mo.) is authority that a woman involved in a case of this character is not an accomplice.

The Missouri law regulating the admission in evidence of dying

statements, and found in Section 4034, Revised Statutes, 1919, announces the principles of the general rule.

"Sec. 4034. PROSECUTIONS FOR ABORTIONS—DYING DECLARATIONS. In prosecutions for abortion or for manslaughter occasioned by an abortion or miscarriage, or by an attempt to produce either, or attempted abortion, or for any crime of which abortion or miscarriage may be a part of the essential facts to be proven, the dying declarations of the woman whose death is charged to have been caused thereby shall be competent evidence on trial of any person charged with such crime, with like effect and under like limitations as apply to dying declarations in cases of felonious homicide: PROVIDED, that the party offering such declarations shall first satisfy the court by competent testimony that such woman was of sound mind when such declarations were made: AND PROVIDED FURTHER, that no conviction shall be based alone upon such declarations unless corroborated as to the fact that an abortion or miscarriage has taken place, and in all such prosecutions aforesaid any physician or medical practitioner who may have attended or prescribed for such woman shall be a competent witness in said cause to testify concerning any facts relevant to the issue therein, and shall not be disqualified or held incompetent by reason of his relation to such woman as an attending physician or surgeon."

A dying statement made by the deceased is competent as evidence and admissible under certain conditions.

State v. Craig, 190 Mo. 339, announcing a rule generally followed, holds it must appear that the declaration was made under a sense of impending and immediate death, and that the declarant at the time believed that she had no hope of recovery.

State v. Walter Lewis, 264 Mo. 420, follows State v. Craig, supra, holding the admissibility of the declaration is dependent upon the declarant's belief of her impending dissolution at the time it is made, and not on the length of time that intervened between its making and her death.

In the several dying statements made to me, I adopted a rule to put two questions to the declarant, in the presence usually of the nurse. "Do you know that you are about to die?" "Have you abandoned all hope of recovery?" Receiving an affirmative answer, in each instance the declaration would be taken in shorthand, immediately transcribed and read to the declarant for her approval. She would be asked if that was her statement, and if her physical condition permitted, she would sign it.

A dying declaration in proper form, supported by the autopsy physician's testimony that an abortion had been performed, and that *causa mortis* was peritonitis superinduced by the criminal operation, constitute a prima facie against the accused.

As you gentlemen well know, a statement made by deceased to one of you in your professional capacity, is not admissible as evidence in a court of law. Such a communication is held as privileged. There are well-founded reasons for the existence of this rule, and no one would

wish to disturb the confidential relation which exists, and necessarily so, between the medical man and his patient.

But the physician must not consider that he is without obligation in the premises. There is incumbent on him a strong moral duty common to all good citizens—a duty to assist in the investigation and punishment of crime. When it is ascertained by the physician that an illegal operation has been performed, he should at once inform the proper authorities of his findings, to the end that a statement, competent as evidence, can be secured from the woman, and introduced at the trial of the accused, in the event she herself is not produced as a living witness.

A medical man may be a recognized expert in his own field; but when he encounters a situation that partakes of a legal nature, he is apt to seek refuge in the accepted ethics of his profession, without first considering the question and possible consequence to himself. You can readily see that this attitude may lead to grave suspicion. I have in mind the following statement of facts as an illustration.

> At an inquest into the cause of death of Mrs. ————, it developed as a finding of the postmortem doctor, that an abortion had been produced. The family physician, who was in attendance on the case testified that when he was called, the woman was running a temperature, and suffering acutely from abdominal pains. On information elicited from her in private inquiry, he diagnosed the case as "probable blood-poisoning" and prescribed accordingly. The woman did not respond to treatment and died.
>
> Asked whether or not she had told him that a criminal operation had been performed, he refused to answer. Asked whether he had determined from his own examination of her, that a criminal operation had been performed, he again refused to answer. Asked whether he had reported the case to the authorities, he replied, "Not until the woman died."

Here, you see the palpable inconsistency of the physician's position. Although he had full knowledge of the circumstances, both from the woman herself, and his examination of her, he hesitated to notify the authorities, because he feared that thereby he would be violating a professional confidence; yet, rather than certify the cause of death, actuated by the same ethics, he considered it his duty to apprise the Coroner of the case; with what results? The facts which he had in good faith suppressed were brought out and made public at the inquest; the lips of the woman sealed in death could no longer speak the name of the person criminally responsible; the verdict—"Peritonitis—resulting from abortion, at hands of parties unknown to jury."

The physician, who in his heart, despised and condemned the wrongdoer, had, in fact, protected him. Justice had not been served.

Whatever qualms or misgivings the medical man may entertain in divulging such confidences, I submit to you, they must be subordinated to his natural desire and duty to assist the State in the apprehension and prosecution of the criminal. (*For discussion, see p.* 81.)

TREATMENT OF ABORTION*

By H. Wellington Yates, M.D., F.A.C.S., and B. Connelly, M.D.,
Detroit, Mich.

THE series of abortion cases upon which this paper is based was taken from records of the gynecological division of the Receiving Hospital in Detroit, admitted from April 1st to August 15th, 1921. During these four and one-half months, we had 81 abortion patients, whose histories included 256 pregnancies, making the instance of abortion 1 to 3.1. It would seem that these figures are fairly conservative from our review of the literature.

A preponderance of cases occur during the second and first half of the third month, probably on account of the nutritional changes of the fetus, rapid development of the placenta causing marked circulatory changes, radical misplacements of the uterus, and criminal interference, which probably embraces 25 per cent.

It is interesting to note the different attitudes taken by members of the profession, together with those of our own Association, in the treatment of abortion.

The success in preventing abortion depends somewhat upon its cause. But, speaking in general, our failures have far outnumbered the successes. Abortions dependent upon diseases of malnutrition, such as tuberculosis, diabetes, or anemia, would suggest rest, feeding and proper environment, with suitable reconstructive medication. Women who show an aborting habit (stock men have this phenomenon constantly before them in animals), should be given one or two years' rest before conception is permitted. Absolute rest in bed ranging from a few days to several weeks may be necessary, together with morphine. The anodyne should be stopped at the earliest possible moment. Enemas should be used, when needed, instead of cathartics.

While lues is more often the cause of abortion in the later months, occasionally its results are seen early. I had a patient who was apparently in good health, but whose husband was Wassermann positive, who had 12 abortions, all spontaneous, before her full-time child was born. She has since had three more healthy children, but between all of them she has had numerous abortions, until they totaled 27. She was never seriously ill with any of them. She desired children, and submitted to medication and confinement to bed without complaint, for long periods of time. For the most part, her abortions occurred on the seventh week. Opiates, rest and uterine sedatives were valueless.

*Read at the Thirty-Fourth Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, St. Louis, Mo., September 20-22, 1921.

I am inclined to believe that, given a patient who is an early syphilitic, both she and her husband should have intensive treatment until they are Wassermann negative in both blood and spinal fluid. We can with some hope look forward to healthy offspring, but with the old cases where the disease has become a part of their very being, pregnancy, when it does occur, should be interrupted. Treatment is of little avail.

There are times when good treatment demands emptying the uterus, as in hypertension and nephritic cases, especially when these evince their symptoms in the early months and are uninfluenced by other treatment. Then there is hyperemesis gravidarum and early incipient tuberculosis. We believe the complete operation done at one sitting is the method of choice, by either dilating and emptying the uterus or performing hysterotomy. The use of rubber bags and bougies, with the necessity of several replacements, appears to me unsurgical and dilatory, and even then, by virtue of an incomplete abortion, often requires later exploration.

When an abortion is complete, and we can be sure of it, rest in bed for seven to ten days, with a good full tray after the third day, is all that is required. There should be no mortality except as a result of hemorrhage during the abortion.

With incomplete abortion the sooner the uterus can be emptied with safety, the better. Much difference of opinion prevails on how this may best be done.

If the cervix is open, easily admitting a finger, and there is free bleeding, my procedure is to empty the uterus by means of the gloved finger under gas-oxygen anesthesia. Provided the mass cannot be thus withdrawn, a Longyear forceps is used for this purpose. We lay great stress on having these patients prepared as for cervical and perineal repair. When once the fingers, or if necessary, the whole hand is introduced, it should not be withdrawn until its purpose is achieved. At least we endeavor to manipulate as little as possible, and seek to avoid introducing anything from below. On the other hand, if there is free bleeding and the cervix closed and not easily dilatable, the patient afebrile, we pack the cervix, if possible, with a strip of iodoform gauze, and the vagina with sterile or borated gauze forced well up to the vault and allowed to remain for twenty-four hours. When withdrawn, the cervix is likely to be open, and often the products of conception are found expelled from the uterus. We freely confess, however, our inability to say whether this uterus is free from all products of conception, and feel more satisfied in our own minds when the index finger is the judge. Signs of infection, as manifested by chill, fever and sweating, are not the only symptoms that indicate trouble. Deciduitis, endometritis, and low grade infections with their

consequences, are the results of retained products of conception, and our surgical sense tells us they should be removed.

When it becomes necessary to use instrumental means for dilatation, the Hegar sounds or graduated dilators are the best, especially in the presence of sepsis. They dilate equably and without trauma. This cannot be said of the Goodale type of instrument.

Barring criminal abortion, neglected incomplete abortion is the most potent factor in sepsis. One never has trouble with therapeutic abortions because they are made complete, but when products of conception, even though small, are left in the uterus, a sapremia results which provides fruitful culture media for the growth of pyogenic bacteria. It is the smaller pieces of placental tissue which are quite large enough to produce sepsis, but are more difficult for the uterus to expel than the larger ones. We remember the protective zone of leucocytes building up its barrier of safety, but we also know that early in the process this small placental fragment furnished the necessity for this reaction and the continuation for the same. Can anything be more logical than carefully removing this exciting cause? We dilate with graduated dilators, taking plenty of time and causing as little trauma as possible. If dilatation is enough, the index finger explores the interior; if not, the curved abortion forceps will take its place. We refrain from the use of the curette, if possible. Curettes have killed more persons than they have saved. Saturated iodinized gauze is packed into the uterus with care, allowed to remain for a moment and withdrawn. We never use intrauterine douches in septic abortion. Rest in bed, opiates, enemas to empty the bowel, with abundance of good food and large hot packs over the entire abdomen, constitute our more common methods of procedure. When the peritoneum is much involved, we morphinize to tolerance, raise the head of the bed, administer hypodermoclysis, glucose and soda bicarbonate by rectum, and liquids by mouth, as soon as they can be borne. Much has been said of electrargol. We have used it in 21, and phenol moniodide in 5 cases, with varying results, sometimes almost spectacular, and again disappointing.

No mortality should occur in spontaneous cases, unless through hemorrhage or the development of chorionepithelioma. The latter eventuality should always be in our thought. The morbidity which results from all kinds of abortions is appalling. The occurrence is progressively more common in the incomplete and septic cases. Complete abortions are often followed by ill health, as a result of hemorrhages, subinvolution, protracted weakness and displacements. It is unnecessary to note that criminal abortion enormously increases both mortality and morbidity, in consequence of the delay in seeking com-

petent advice until the symptoms become pressing, and the infection passes beyond the confines of the uterus.

Taussig, quoting from the report of Sittner's Clinic, shows that in 267 abortions, not attended by fever, only one death occurred; but from 35 septic cases, 3 fatalities ensued, while figures from Maygriers' series gave a mortality in the spontaneous cases of 0.57 per cent, while that of criminal abortion was 56.8 per cent. Undoubtedly, abortion is the most mistreated of all gynecologic conditions.

As an inhibitive measure to criminal abortion, the physician has an opportunity to acquaint the patient with the sequelae of her contemplated act, especially in regard to the wrecking of her health. If she can be made to know that even if she were not to die, a life of invalidism and operations confronted her, she might hesitate though the moral argument failed to appeal to her. We have repeatedly found this explanation to be effectual.

SYNOPSIS OF CASES ADMITTED TO THE RECEIVING HOSPITAL, DETROIT, FROM APRIL 1 TO AUGUST 15

Incomplete septic abortions, 26; incomplete abortions, 23; complete abortions, 15; threatened abortions, 4; postabortal septicemia, 4; miscarriages, 4; postabortal chorionepithelioma, 1; total, 81.

Average days in hospital, 10.7 days; shortest period in hospital, 12 hours; longest period in hospital, 30 days; average age of patients, 26 years; oldest patient, 40 years; youngest patient, 15 years.

Causes.—In the 81 cases, 25 were self-induced; others were produced by midwives or other women. Four were produced by curettement in the doctor's office or patient's home. Others by falling, lifting, etc. Many given as cause unknown were undoubtedly criminal.

Complications. Uterine fibroids, 3; acute anteflexion, 2; cervical lacerations, 2; goitre, 2; acute gonorrhea, 2; follicular tonsillitis, 2; chronic endocervicitis, 2; secondary lues, 4; pulmonary tuberculosis, 1.

1229 DAVID WHITNEY BUILDING.

(*For discussion, see p.* 81.)

ADDITIONS TO OUR OBSTETRIC ARMAMENTARIUM*

By Charles Edward Ziegler, M.D., F.A.C.S., Pittsburgh, Pa.

A NEW METALLIC NIPPLE SHIELD

THE shield shown in Fig. 1 is made of commercially pure aluminum and is perforated as indicated. Its base is 2½ inches in diameter; its dome on the inside is an inch in height, an inch in diameter at the bottom and ⅞ of an inch at the top. Its base is flared to conform to the convexity of the breast and is bordered by a rolled edge.

Metallic nipple shields "for the prevention and cure of sore nipples" are not new. Perhaps the best known is the lead shield invented by Dr. Wansbrough, an Englishman, and described by him in the London Lancet under date of July, 1842. This shield has been used extensively for more than half a century and is still in use; an illustration may be seen in De Lee's Obstetrics. Marvellous curative properties

Fig. 1.

have been attributed to it. Wansbrough claimed that "its curative character consists in the nipple being immersed in a solution of lactate of lead formed by the lactic acid in the milk acting upon the metal."

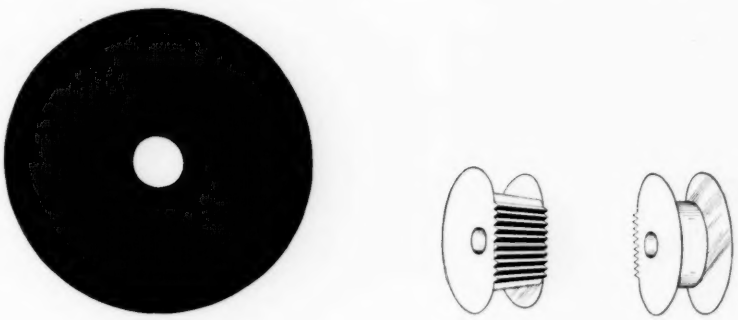
It is more than likely that lactate of lead has had little to do with the good results obtained. The explanation is to be found rather in the protective character of the shield. Indispensable conditions for the treatment of the abraded, fissured, inflamed and sensitive nipple are: absolute rest of the part and its certain protection against traumatism of every sort, including that of the gown, bedclothing, binder, and occlusive dressings. These conditions the protective shield provides.

If it were possible to carry it out in practice, the "open-air treat-

*Read at the Thirty-Fourth Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, St. Louis, Mo., September 20-22, 1921.

ment'' would undoubtedly give good results. Occlusive dressings, in addition to the traumatism which they cause, favor the accumulation of moisture and maceration of the epithelium. Hardly secondary in importance, therefore, is the ventilation of the affected nipple.

Whatever differences of opinion there may be in regard to local applications to the nipples, this shield takes care of them. It effectually prevents the application from being rubbed off or absorbed by clothing or dressings and in cases where compresses are being used, the perforations in the top of the dome make it a simple matter to



A. *B.* *C.*

Fig. 2.

A. *B.*

Fig. 3.

keep the compress wet (with a dropper) without the necessity of removing the shield.

The shield is kept in place by means of a properly applied binder or efficient breast suspensory, provided with an opening for the dome of the shield. The breast must be immobilized in any event, since otherwise the nipple cannot be put at rest.

For a number of years this shield has been in use in my service with gratifying results. It is presented to the profession with the hope that it may find a much larger field of application.

AN UMBILICAL CORD CLAMP

Fig 2 represents the separate parts of which the umbilical cord clamp is composed: The rubber disk (*A*)—the sole source of power upon which the clamp operates—is 1⅝ inches in diameter, ¼ inch thick, with a ¼ inch hole in the center. The companion jaws (*B* and *C*) of the clamp are identical in every way. When their clamping surfaces are properly applied to each other, the little serrations mesh perfectly, providing compression surfaces 7/16 of an inch long and ¼ inch wide. The combined thicknesses of the jaws when in contact, form between their flanges a shaft 7/16 of an inch in diameter. This shaft is gripped by the rubber disk which is held in place by the flanges of the jaws. The disk is made from rubber of the very best quality obtainable for the purpose and the jaws from Monel metal—a noncorrosive nickel alloy which is in no wise affected by antiseptics, blood or other tissue substances.

Fig. 3 shows a side view of the assembled clamp (*A*) closed, also the retractor (*B*) used in opening the clamp and applying it to the cord.

Fig. 4 shows the clamp open with the retractor attached. The opening provided is ½ inch long and 7/16 of an inch wide—sufficient to receive the largest cord.

Fig. 5 shows the clamp closed upon a piece of umbilical cord, as reproduced from a photograph. Note the arteries and vein.

Fig. 6 shows the manipulation used in exposing the surfaces of the clamp jaws for purposes of cleaning—scrubbing with a brush.

The primary object of ligating or clamping the cord is, of course, to prevent hemorrhage; and while it is true that hemorrhage would rarely occur even were the cord not compressed, especially after the establishment of respiration, the fact remains that hemorrhages have occurred and even with fatal termination. In fifteen years I have had two cases of secondary hemorrhage from the cord which were all but fatal. It is likely, therefore, that some form of compression will always be regarded as necessary.

No matter at what point the cord is ligated, separation always occurs at the same place—the skin junction; and always by the same process—death of the stump and its removal by granulation tissue. Mummification or dry gangrene of the stump is of first importance, since it minimizes the chances of infection and hastens its separation. On the other hand moist gangrene, infection, and delayed separation go hand in hand. Asepsis and the elimination of moisture are therefore indispensable considerations in the treatment of the stump. If this be true, it then follows that under similar aseptic conditions that form of compression is best which most completely squeezes out the moisture from the tissues of the stump. In this respect there can be no question but that the clamp has great advantage over the ligature and that

a clamp such as I am describing is far more effective than the usual artery forceps type of clamp, for the reason that there is no yielding in the compression as the tissues of the cord give way.

The serrations on the jaws of the clamp cut through the amniotic covering of the cord and thus facilitate the escape therefrom of the jelly of Wharton and other moisture. The clamp moreover fixes the

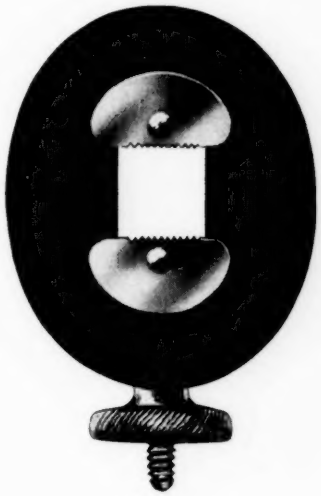


Fig. 4.

Fig. 5.

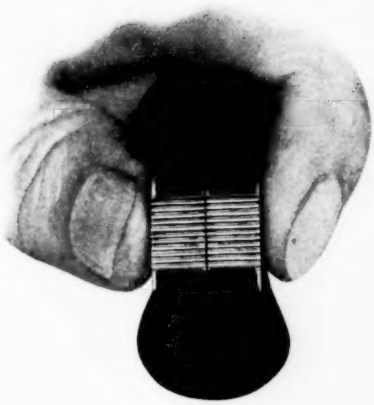


Fig. 6.

stump and through the slight traction which it exerts upon it, keeps it elevated and away from the skin of the abdomen where perspiration otherwise adds to its moisture.

From what has been said it is evident that next in importance to asepsis, is the removal of all moisture as fast as it is squeezed from the stump by the clamp. This may be accomplished best by the liberal use of sterile absorbent cotton packed closely about the stump between

the clamp and the skin. Gauze will not do since it is less absorbent than cotton and impossible to keep in close contact with the stump. A convenient way of utilizing cotton for the purpose is to be found in the form of a pad a half inch or more in thickness, with a small hole in its center. The pad is passed down over the cord by pulling the latter through it with an artery forceps. With the pad in place, the cotton is packed snugly about the stump with a tissue forceps. After applying the clamp to the cord close to the skin junction, the cord is cut just beyond the retractor, the retractor removed, the stump and clamp covered with a similar pad of cotton, and over all a sterile gauze binder, pinned in place.

It has been our experience that if the cord is crushed with an artery forceps before applying the clamp, the time of separation of the stump is materially shortened. Following this procedure we have invariably found the stump at the end of 72 hours either completely separated or reduced to a very thin parchment-like remnant readily twisted off by rotating the clamp.

Because of its small size, light weight and adaptable form the clamp may be incorporated into the cord dressings without discomfort to the baby and may be either left in place until the stump drops off or removed after some hours as is done with other clamps.

To those members of the profession whose custom it is to clamp the cord, this clamp will make its strongest appeal. Its simplicity, durability, compactness, strength and unyielding dependable pressure, leave little to be desired.

AN IDENTIFICATION WRISTLET FOR INFANTS

Preventing babies in a hospital nursery from "getting mixed" may not be regarded as a difficult task and yet it demands constant watchfulness. Various devices for "marking the babies" are in use and accomplish the purpose, but so far as I know an entirely satisfactory one has as yet not been announced.

The marks of identification must be in plain view or readily accessible at all times; they must be capable of instant and unmistakable interpretation; they must be proof against mutilation, soiling or other agency which may destroy them or render them indistinct; and the device which carries them must be sanitary, substantial yet simple, capable of being quickly and easily applied, free from discomfort or injury to the baby, and must be reasonable in price. To meet these requirements, the wristlet which I am presenting has been devised.

Fig. 7-*1*, *2*, *3*, *4*, *5*, and *6* were made from drawings of the component parts of the wristlet, and, while somewhat diagrammatic, nevertheless give correct ideas of form, relations and detail. Fig. 7-*7* is an excellent reproduction from a photograph of the wristlet as it appears in use, with seal attached.

Fig. 7-*1* represents the mounting of the wristlet which has been pressed into shape from a single piece of metal. It is curved to conform to the more or less oval contour of the wrist and has two compartments—*A* and *B*: *B* to receive the rubber band (*2*) upon which it is mounted; and *A* to receive the identification label (*3*) and the celluloid shutter (*4*), which latter covers and protects the former. The mounting is ⅞ of an inch long, is ½ inch wide and made of Monel metal, a noncorrosive nickel alloy.

Fig. 7-*2* represents the rubber band which encircles the wrist of the baby and supports the mounting (*1*) described. The band which it is

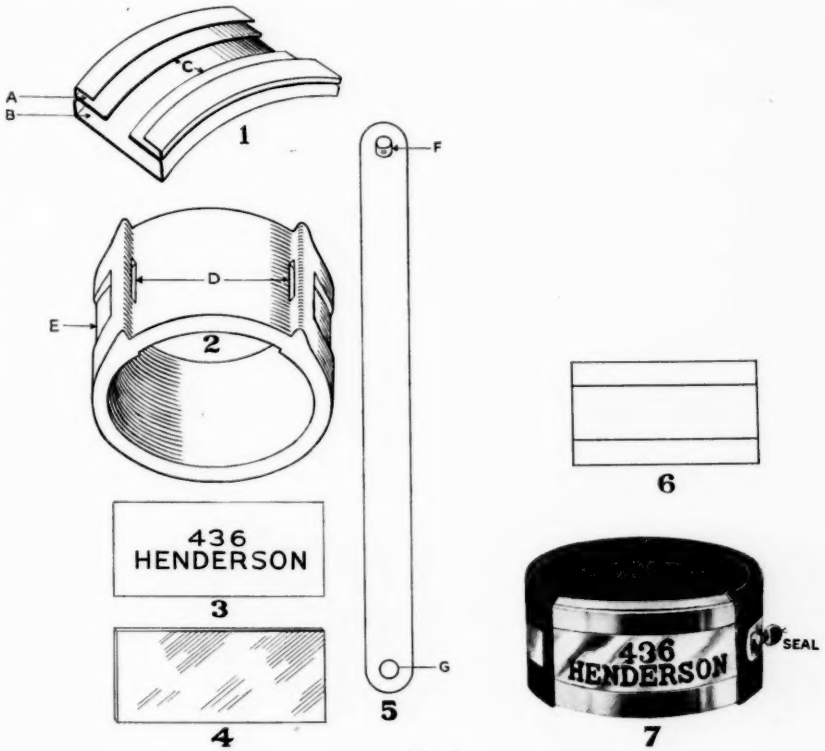


Fig. 7.

proposed to make from steel-gray rubber (not black as indicated), is ½ inch wide and 1/16 of an inch thick with local expansions. It has inside diameters (being oval) of ⅞ and 1⅛ inches respectively—the size which fits comfortably the arm of the average infant during the first weeks of life. A larger size will have to be provided for the very large babies.

All exposed edges of the mounting are well protected by the overlapping edges of the rubber band. The two prominent ridges or expansions running across the band on the outside, with abrupt vertical surfaces facing each other, serve the especial purpose of sealing com-

partment *A*, after the identification label (*3*) and the celluloid shutter (*4*) have been shoved into place. The sunken channel (*E*) encircling the rubber band on the outside, together with the openings (*D*) communicating with it, are provided to receive the flexible metal tape (*5*) to be described.

It will be seen that in order to get the rubber band into compartment *B*, it is simply necessary to stretch it until its reduced size passes the narrow rectangular opening (*C*) between the two compartments. That part of the rubber band which lies between the two expansions described, is the portion which fills compartment *B* and in length is ¼ inch shorter than the compartment. When therefore the band is released after passing into compartment *B* and regains its former size and shape, the ends of the mounting (*1*) become well embedded in rubber and compartment *A* very effectually sealed at either end.

Fig. 7-*3* represents the identification label containing the room number and name of the mother of the baby—a paper label of the thickness of ordinary writing paper used for business purposes. Because of its small size (⅞ by ½ in.) the label is trimmed after being inscribed, from a stock label (2 by 3 in.) upon which is printed the rectangular figure (*6*) outlining the exact size of compartment *A* and indicating the space available for the inscription.

Fig. 7-*4* represents the celluloid shutter of the size of *3* and of the weight and material used in automobile curtains. It serves as a transparent shutter covering and protecting the identification label (*3*) and fitting snugly into compartment *A* exernal to the label which is inserted first.

Fig. 7-*5* represents the flexible metal tape 3/16 of an inch wide, used in sealing the wristlet on the arm of the baby. It will be seen that in the assembled wristlet, the rectangular opening (*C*) beween the compartments *A* and *B* of the mounting (*1*) becomes a tunnel which opens at either end through *D* into the sunken channel (*E*) surrounding the rubber band on the outside. After the wristlet has been placed upon the baby's arm, the metal tape (with the free end containing the hole *G* in advance) is inserted into the opening *D* from one side, is pushed through the tunnel (*C*) out through *D* on the opposite side and thence along the channel (*E*) around the rubber band to the starting point where the pin (*F*) on the other end of the tape has arrived. The hole (*G*) is passed over the pin (*F*) and the tape is sealed in place by crushing a perforated shot upon the free ends of a piece of very soft copper wire passed through the hole near the top of the pin.

The Wristlet in Use.—The wristlet will be received by the hospital with the mounting (*1*) in place upon the band (*2*). All that the nurse needs to do is to take a label from the supply box, write the room number and name upon it, trim it to the size indicated and slip it

into compartment *A* and over it the shutter. By pulling upon the band just beyond one end of the mounting and then turning the stretched end into the concavity of the mounting and holding it there, the corresponding end of the compartment will be fully exposed so that shoving the label and shutter into it becomes a very simple matter. The wristlet is now ready for the baby and is applied by simply stretching the band until it passes over the baby's hand and the wristlet is in place. The metal tape is next applied as above described and the seal attached. The wristlet should be gotten ready during the labor and put on before the baby leaves the delivery room.

4700 Fifth Avenue. (*For discussion, see p.* 85.)

TEACHING UNDERGRADUATE OBSTETRICS*

By A. M. Mendenhall, M.D., Indianapolis, Ind.

DURING the last twenty years there have been a few valuable contributions to the practice and teaching of obstetrics, but no progress has been made toward reducing the total number of maternal deaths due to childbirth. Only a casual glance over the records of vital statistics in the registration areas of the United States is necessary to see clearly there has been, on the contrary, an increase in the maternal death rate.

In order that this may be proved beyond doubt, we must go back at least twenty years and note the gradual increase and not be misled by going back but three or four years and, thereby, fail to consider the fact that the years 1918 and 1919 saw a very great increase which, in reality, was largely due to influenza.

In a recent article by J. O. Polak[1] it is stated that "from 1902 to 1919 there was noted an increase to approximately three times as many deaths from sepsis, four times as many deaths from eclampsia, and twice as many deaths from other obstetric causes, besides the hundreds that die annually from indirect results of labor, as from injuries and consequent operations for repair, from nephritis originating during pregnancy, and from endocarditis aggravated by repeated labors."

By careful analysis of the records we find that, in 1916, there were approximately 16,000 deaths due to childbirth and, in 1918, 23,000, this marked increase being largely due to influenza. Nevertheless the one outstanding fact remains, that approximately 20,000 women die annually in the United States as a result of pregnancy and labor. Out of this number of deaths, approximately 28 per cent are due to sepsis alone,[2] a fact that seems but a sad reflection upon our care of the puer-

*Read at the Thirty-Fourth Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, St. Louis, Mo., September 20-22, 1921.

peral patient. Also, about 20 per cent of these deaths are due to toxemia of pregnancy, although it is well known that proper prenatal care should very greatly reduce these figures.

The number of infants lost as a direct or indirect sequela to improper obstetrical care, is appalling in the extreme. If we add to this the great morbidity rates for mothers and infants, for which we have no satisfactory statistics yet very logical deductive evidence, it at once becomes apparent that we are falling short of our duty.

In other branches of medicine, almost without exception, there has been marked progress in the last two decades; but in obstetrics we have but little to which we may point with pride. And when our attention is called to these facts it seems well to pause long enough to try to find the reason.

The writer is becoming more and more convinced that one of the fundamental reasons is that there are some defects in our methods of teaching obstetrics.

We will agree in advance with all those who feel that the laity must become better educated to the fact that the process of childbearing is not a normal physiological event, and that every primipara who gives birth to a full term child has, at least, some pathologic lesion, and that this may be, and frequently is, quite serious if not fatal. We realize that if the laity could be made to thoroughly understand these facts, a great obstacle would be eliminated and much progress could be made; but this would by no means answer the whole question. And before we can hope for even a small minority of the laity to understand this, we must be sure that their instructors, the physicians themselves, are properly impressed with these facts. Rarely does the obstetrician pass a day when he does not see or hear of some practitioner who still feels that obstetrics requires but little skill and care. Hence our first and greatest defect in teaching obstetrics in the past has been that we have failed to impress our students with the seriousness of the case, when they are conducting the care of a woman through the period of pregnancy, labor, and the puerperium.

This is in part due to the fact the heads of our teaching institutions have been and still are unwilling to place the department of obstetrics on its proper level with the departments of surgery and medicine. They themselves have not been properly impressed with the importance of obstetrics and do not regard it as a definite and independent specialty and are, therefore, unwilling to give this department its proper ratio of time and equipment.

Many educators feel that we are rapidly approaching the time when the busy obstetrician, as well as other clinicians, must have compensation commensurate to the services he renders his school, else the service may become too largely delegated to assistants and more infe-

rior teachers. Whether the head of the department of obstetrics should be a full time professor is a question which is confronting us at the present and, if this offers a real solution for the better teaching of obstetrics, it is deserving of careful consideration. But it is with conditions as they exist at present that I desire to search for weaknesses and offer remedies.

In this attempt I have sent out a questionnaire to twelve of our leading representative teaching institutions in the country with the view of determining, as nearly as possible, how the departments of obstetrics are being conducted.

The first two questions are as follows: "In what year of the medical course is obstetric teaching begun?" "Of what does the first course consist?"

The answers to these questions are quite uniform, showing that a general didactic course in embryology, and the physiology of pregnancy, labor, and the puerperium is started in the third year. In a few instances we find that didactic obstetrics is introduced in the second year. Unless the student has completed his courses in anatomy and physiology, as well as having had some training in physical diagnosis, it is very doubtful whether he is ready for didactic obstetrics; and, since these elementary and fundamental subjects are, in most instances, not completed until the end of the second year it would seem that obstetric teaching is best introduced in the third year.

The next four questions were submitted with the idea of ascertaining the relative importance given to didactic, clinical, and manikin courses, and the average length of time devoted to each of these divisions. The replies showed that 86 hours were given to didactic obstetrics, 81 hours to clinical obstetrics and 31 hours to manikin practice. There were no wide variations in these answers except that one school has as many as 90 hours of manikin practice, and another as few as 8 hours. It is doubtful whether 8 hours is more than one-fourth sufficient time for the student to have in manikin practice. If a proper demonstration is given, and then the practice on the manikin is properly supervised, there is little doubt but that 30 hours can be most profitably utilized in this method of teaching. One of the most important fundamentals in the study of obstetrics is a perfect understanding of palpation, corroborated by an actual view of the various points considered in presentation and position, and a familiarity with the various manipulations to be acquired in prolonged work over the manikin. The average student has great difficulty in memorizing from lecture notes or textbooks the many points which can be made very practical and easy for him to remember, by a properly conducted manikin course. Less than twenty-five or thirty hours spent in this work will certainly leave much to be learned.

The next question proposed was "When, in the obstetric course, is the manikin practice started?"

There was but little uniformity in the answers received, but there seemed to be very excellent reasons why this course should be delayed until late in the senior year, after the student has completed, or practically completed, the didactic lectures in obstetrics. In other words, after he has had a thorough course in the theory of obstetrics, the manikin instruction will be a supplementary, practical application of his theoretical knowledge; it will serve to emphasize by sight and touch those facts which have been presented didactically.

The next three questions were closely related and will be discussed together. They are: "On an average, how many deliveries does each student see in a hospital?" "Are these deliveries conducted by members of the staff or by internes?" "In how many hospital deliveries does each student actively assist or personally officiate?"

These questions brought out the fact, that on an average, about fifteen hospital deliveries are witnessed by each student; but some schools fall far below this average and, the most lamentable fact is that these deliveries, unless abnormal, are almost invariably conducted by internes. The average interne is but very little more skilled than the student and has, as a rule, received his training in the same imperfect way, and falls very short of the proper amount of knowledge and skill to be posing as an instructor. In no instance, probably, is the truth of the old adage so well seen as here,—"He who is teaching all he knows is teaching very poorly." In other words, the student ought to see a number of normal as well as abnormal deliveries, in a well conducted maternity, by some one who understands thoroughly the art and science of obstetrics and who has an intimate speaking knowledge of the mechanism of normal labor and the ability to demonstrate the conduct of such a delivery. When a recent graduate goes into practice, most of his cases will probably be the so-called normal labors, and it is in regard to the conduct of such cases as this that he should have been most carefully and painstakingly educated. When the chief of the obstetric department does not take sufficient interest in these cases to make sure that his students are properly instructed on this most vital part of the course, he is not only neglecting an opportunity to do a vast amount of good in a comparatively short period of time, but is falling decidedly short of his duty. It contributes strongly to a real weakness in our teaching the subject of obstetrics. In some of our maternities where there is on duty a resident obstetrician, who presumably, and usually does have, an obstetrical knowledge far in excess of the average interne, it may be right and proper to allow him to act as demonstrator in normal deliveries; but this must be left to the decision of the chief of the department. When

we have educated the profession and the laity to a greater appreciation of hospitalization of obstetrical cases, and when our teaching institutions own, or control, much larger maternities than at present, we will be better able to permit students more frequently to assist or officiate in the delivery, under skilled supervision, of at least a few hospital cases, although the answer to this question shows an average of but two deliveries. Three schools reported that they make no attempt to let the student assist in labor cases.

The next four questions bear upon antepartum and postpartum care and were as follows: "How many antepartum cases are examined by each student?" "Is there a regular antepartum clinic conducted and is a member of the staff present at dispensary hours?" "Does each student have ample opportunity to see hospital postpartum care?" "Does each student have ample opportunity to see the hospital care of the newborn baby, and of premature babies?"

The answers to these questions were very gratifying. They showed that an average of sixteen complete antepartum examinations are made by each student, that every school conducts a regular antepartum clinic, and that a member of the obstetrical staff, or a resident obstetrician, is always present at the dispensary hour.

With this part of the obstetrical course so well provided for, the writer has no comment, other than to say that in obstetrics, as in other branches of medicine, diagnosis is of transcendent importance and that a well conducted large antepartum service for each student cannot fail to greatly enhance his knowledge of obstetrical diagnosis; and that prolonged service in this department will go very far toward impressing him with the great importance of prenatal care and thorough antepartum examinations, measurements, and records.

As to postpartum hospital care, it seems that all schools are availing themselves of ward work and bedside instructions to the extent of their capacity; all agree that the student should see and know as much as possible about the puerperium.

The next three questions bear upon abnormalities and are as follows: "How many forceps deliveries are observed by each student?" "Does each student assist in at least one forceps delivery?" "Does each student, under staff supervision, perform or assist in performing at least one second degree perineorrhaphy?"

The replies to these questions show that an attempt is made for all students to witness a few forceps deliveries, but very little opportunity is given for assistance. A number of students are graduated without ever having assisted at a forceps delivery or a perineorrhaphy. Whether or not this should be left until the interneship period, brings up three very important questions. First, whether right or wrong, we are confronted with the fact that there are still many graduates who

go direct into practice without having served an interneship. Secondly, whether the physician in general practice should be considered competent to apply forceps may be questioned; but he is doing it and, undoubtedly, will continue to do it for a long time to come, and it certainly seems that his first experience should not be in the home of the patient and without competent supervision and assistance. Thirdly, granting that he will serve an interneship, is it right and proper that his first personal experience with the forceps should not be supervised even though it be under hospital conditions? Not long since, I saw this idea put into practice with a really very unique result. The left blade of the forceps was skillfully applied, but as the right blade was inserted it was so rotated and manipulated that it found its way to the same side of the pelvis as the left blade. Without supervision, it may have been difficult for this newly appointed interne to have discovered his error and to have properly corrected it. So long as our graduates continue to go out into practice with the mistaken conviction that they are competent to do forceps deliveries, we believe there should be a marked increase in their opportunity to obtain more training under supervision; and, certainly, no man should practice obstetrics who is not competent to repair a second degree laceration of the perineum. I do not believe he will attain this competency in any way whatsoever except by personal assistance under skilled supervision.

The eighteenth question in the questionnaire was upon the subject of outdoor obstetrics and is subdivided as follows: "(a) How long is each student on outdoor obstetric service? (b) How many cases does he deliver there? (c) To what extent is he followed up and supervised by members of the obstetrical staff? (d) Does a member of the staff see many of the outdoor cases during labor or puerperium? (e) About what per cent of the cases are thus visited?"

The average length of time spent on outdoor obstetrics was found to be eighteen days, and the average number of cases delivered was fifteen.

In one of our leading institutions the answer, as to whether a member of the staff sees many of these cases, was negative. This I know to be a frank confession, and I cannot look upon it except as a very sad commentary on pedagogical methods, as well as from a standpoint of the patient's interest.

This naturally leads to a discussion of outdoor obstetrics in general. What is to be gained by it and what are the pitfalls? It is refreshing to learn that one of our best schools has no outdoor deliveries. This school has a thoroughly supervised prenatal clinic. It is one of the schools which gives ninety hours to manikin practice, but does not feel that the outdoor deliveries can be sufficiently super-

vised to be worth the time and effort on the part of the student, at least if a reasonable maternity service is available. There are but two points to be gained by this so-called tenement obstetrics; the one is confidence and self-reliance, the other is an opportunity to see and examine a few women in labor. Self-reliance is desirable and should be cultivated, but it is very doubtful whether it cannot be better and more safely acquired otherwise. Confidence, in a degree is desirable, but with it comes two dangerous pitfalls. One is that the student attends a few so-called normal labors and Nature is good enough to permit the patients to survive, and the result is that the student develops very early a superabundance of confidence and begins to look upon labor as too nearly a normal physiologic process. Then, too, unless he is most thoroughly supervised and followed up, his many errors are not pointed out to him and he goes ahead fully persuaded he has been entirely right. The technic followed in most outdoor obstetric departments is crude at the best, yet the student is quite sure to decide it is good enough. If we are going to contribute our part toward reducing puerperal sepsis, we must persistently teach the most rigid labor technic, as we cannot expect the student when he goes into practice to follow a better technic than he has been taught. In fact it will usually be very much inferior. Therefore, if we permit the impressions to make headway in his mind which are, ordinarily, obtained in his outdoor obstetric work in college, they will be very likely to become permanently implanted there.

The last two questions were as follows: "How many beds have you available for obstetric teaching? Are these beds entirely under control of the school?"

It was found that an average of 46 beds was available for obstetric teaching and these were, generally, under control of the school. Hirst maintains that the school should assign more beds to obstetric teaching than to either medicine or surgery, because the average instructive capacity in each case is limited to one or two students. In this same article Hirst[3] advocates that a school having 400 students should have 100 beds available for the teaching of obstetrics, although it is to be remembered that he is a strong advocate of a combined department of obstetrics and gynecology and these figures are given on that basis. The controversy as to whether these two subjects should be combined for teaching purposes will not be discussed in this paper. The one outstanding fact is that any school pretending to educate students in obstetrics should have 50 to 100 beds available for this purpose alone, and these should be absolutely under the school's control, and not under the control of any private or city institution. In this connection I cannot do better than quote from a recent address by Polak[4]: "In order to turn out men who are even qualified to attend a primip-

ara in labor, there must be greater clinical facilities for instruction of our students. Millions are expended every year for research and laboratories but almost nothing is given to the establishment and maintenance of properly equipped maternity hospitals. Why, if it is necessary for the American College of Surgeons to require an apprenticeship in surgery before a man can be recognized as capable of doing a surgical operation, is it not just as necessary that the man who is to deliver a woman should have sufficient training to insure a satisfactory recovery and a live baby?''

The writer would ask further: Why teach a man to practice obstetric operations in the homes of the patients and condemn him for doing an appendectomy in the same place?

CONCLUSIONS

1. A greater effort should be made to impress the student that obstetrics is a major division of the medical curriculum, and that few, if any, primiparas are ever delivered of full-sized infants and left in as perfect condition as before delivery.

2. Then, when the student goes into obstetric practice, he will carry this impression with him to the laity and do his part toward educating the public as to the importance of proper obstetric care.

3. More emphasis should be laid upon the proper management of so-called normal labor cases, and not so much of the student's time taken up in trying to teach him the various kinds of cesarean sections and other obstetric operations which should only be performed by the skilled obstetrician.

4. So-called outdoor obstetrics is, at its best, of little real value to the student, and it would be better to abandon it entirely, than to continue this sort of teaching without very thorough and continuous supervision by the teaching staff.

5. Since diagnosis in obstetrics, as in all other branches of medicine, is the real foundation for proper care and treatment, it is well to utilize every possible opportunity to teach this branch most thoroughly, and that the student's ability in this line be developed by prolonged manikin practice, by large numbers of antepartum examinations, and by wide clinical experience.

6. Teaching by internes, or by those who have but very little more knowledge, is sure to create a wrong impression as to the importance of the subject, and to fall very far short, directly and indirectly, of the result desired.

7. One of the most important ways in which we can soon obtain better results in teaching obstetrics, is to educate the laity and our hospital managers to a realization that a large and well-equipped

maternity is the best place to teach and practice obstetrics; and that this will at once contribute strongly toward a reduction in the fetal and maternal death rates in the community in which it is established, as well as in the communities where the students later go to practice.

REFERENCES

(1) Jour. Am. Med. Assn., lxxvi, No. 26, 1809. (2) Am. Jour. Hyg., March, 1921, i, 197. (3) Am. Jour. Obst. and Gyn., Nov., 1920, i, 128. (4) Jour. Am. Med. Assn., lxxvi, No. 26, 1810.

2369 Southeastern Avenue. (*For discussion, see p.* 86.)

A METHOD OF DELIVERY IN NORMAL CASES*

By Magnus A. Tate, M.D., F.A.C.S., Cincinnati, O.

THE average duration of a normal case of labor varies from sixteen to twenty hours in the primipara and from ten to sixteen hours in the multipara. If by aiding Nature's efforts, we can materially cut the time without harm to mother or child and make the labor less painful, we are benefiting womankind.

All obstetricians are familiar with the uncertain nagging pains accompanying the often drawn out first, and the intense suffering incident to the second stage of labor.

You are also familiar with the frequent statement of some women: "I have never been well since the birth of my baby," and we know that this is due, not alone to unrepaired lacerations, but more frequently to the long drawn out first stage of labor, followed by an agonizing second stage, which leads to physical exhaustion and, in turn, is often followed by a peculiar syndrome of the neuroses. This is manifestly too true when we encounter those cases of badly managed malpositions in elderly primipara with a slight narrowing of pelvic diameters, who are allowed to drag through a harrowing labor; as well as in those cases of hysterical and frightened primipara and neglected dry labors. Such cases you see as consultants, or as staff members of our charitable hospitals.

Many are the remedies advocated to alleviate the pains of labor. We know that most of them have been discarded with the exception of the various anesthetics, morphia and chloral.

Advancement in the obstetric art is not so much in the selection of some method of delivery, as in the adoption of prenatal care and the observance of rigid asepsis.

We follow out methods of delivery as given to us by our forefathers, because, mechanically, their deductions were usually correct.

Skill is paramount to success, and the advent of asepsis has given

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us a leeway and freedom to attempt much that, in the past, was not advisable or wise.

Accouchement forcé has met with unfortunate results because of forcible dilatation of the cervix followed by the immediate and rapid delivery of the child. There is no doubt that it has been the means of saving some lives, especially when dealing with desperate conditions, such as hemorrhage, eclampsia, edema of the lungs, and non-compensating hearts.

Accouchement forcé is a major operation. The forcible dilatation of a firmly closed os and rapid delivery of the child must, necessarily, be followed by a high maternal and fetal mortality. The dilating of an unobliterated cervix, other than by instrumental means, is a most difficult task. Forcible dilatation is rarely practiced today. It is comparatively easy to open up a soft dilatable cervix by the Harris method.

I give much credit to Potter for demonstrating and emphasizing that a vagina can be effectively dilated without injury to vaginal and muscular structures by the ironing-out process.

CASE 1.—Mrs.————, a refined and cultured woman, multipara, aged twenty-six. Her first labor occurred at the age of twenty-two, and was twenty hours in duration; normal presentation; instrumental delivery; perineal laceration requiring two stitches. The second labor, at the age of twenty-four, was eighteen hours in duration; twin birth; perineal laceration requiring two stitches. A slow recovery occurred in both deliveries. The following year she was subjected to an appendectomy. Third labor, age twenty-six. Knowing so well of the protracted recoveries of her previous labors, and of the appendectomy one year ago, I determined to try a method of delivery that I had been contemplating for some time.

The patient entered the Good Samaritan Hospital with the os dilated to the size of a silver half dollar. She was in the best of spirits, having regular, easily bearable pains, ten minutes apart. She was prepared obstetrically and taken to the delivery room at 10:00 P.M. Ether was administered to the surgical degree; the bladder was catheterized, and the specimen sent to the laboratory. The gloved hand, anointed with sterilized vaseline, was then introduced in the vagina, one finger at a time, following the ironing-out method. The thin and easily dilatable os and vagina were thoroughly stretched by 10:30 P.M. Anesthesia was withdrawn at 10:32 P.M. The patient was allowed to recover partially from the anesthetic by 10:40 P.M. One-half of one c.c. of pituitrin was now given, and the membranes ruptured. Regular pains ensued shortly. The patient was in a drowsy state and did not seem to suffer much. The child was delivered at 11:10 P.M., just one hour and ten minutes after the patient's entrance into the delivery room. The child weighed eight pounds. There were no lacerations.

This patient could hardly realize, thinking of her two previous labors, that she had actually been delivered within one hour and ten minutes. The following day, after a good night's rest, she showed no signs of exhaustion, and described her condition as follows: "I feel like I had had some slight vaginal operation, and while I am sore, I have not the same feeling that I had with my other labors."

CASE 2.—The patient entered the Bethesda Hospital, giving the history of having had the membranes ruptured at 8 A.M. I saw her at 9 A.M. The os was not dilated sufficiently. The pains were easily bearable. Examination at 10.40 A.M. showed

the os dilated to the size of a silver half dollar, and one hand presenting. The patient was taken to the delivery room at 11 A.M. She was anesthetized at 11:30 A.M. The hand was replaced. Dilatation of the os was complete at 11:50 A.M. The patient was partially out from under the anesthetic by 12:05 P.M. One-half of one c.c. of pituitrin was given. Pains were not efficient. Pituitrin was repeated at 12:25 P.M. Rapid delivery followed at 12:35 P.M. Perineal tear, requiring three stitches. The time between entering the room and complete delivery was one hour and thirty-five minutes. That afternoon the patient's condition was very different from one who had gone through the ordinary labor. In this case the second dose of pituitrin was, probably, given too hurriedly; otherwise, I do not believe that there would have been a laceration. In two cases patients did not seem to be susceptible to the action of pituitrin, so forceps were applied after waiting one hour.

CASE 3.—Patient's first labor lasted four days, midwife attending. She was rushed to a hospital and delivered instrumentally. The baby lived six days. It weighed nine pounds and six ounces. The mother was profoundly exhausted, ran a septic temperature for three weeks, and at no time did she have mammary secretion. The pelvic soft structures were like parchment, simply dried out and tore readily. The extensive lacerations of both cervix and perineum were repaired. This patient's second labor occurred under my care in the hospital. She was delivered in two hours and forty minutes. There was no perineal tear, but one side of the cervix tore, which was immediately repaired. No exhaustion, mammary secretion normal; baby weighed nine pounds.

Another case I have had was that of a hypersensitive, hysterical, neurasthenic patient. She was crying, tossing about, and "knew that she was going to die." She refused to obey any instructions or commands. She was delivered in two hours and forty minutes.

This was one of the cases where forceps were used to lift the head over the perineum. I am sure you will agree with me, that this kind of case requires much patience, tact, and ingenuity.

Another case, that of a young negress, primipara, aged eighteen, I saw with a young physician at my solicitation. Delivery was effected in one hour and forty-five minutes. The child weighed seven pounds and four ounces.

In a later case, that of a young primipara, aged twenty-one, weighing 100 pounds, there was a very bad mitral lesion. She had been under her physician's care for a period of two years. This patient was delivered in one hour and fifty minutes. No laceration, no exhaustion, and recovery was uneventful. The child weighed six pounds and six ounces. Other cases, so far attended, were uneventful, all having been delivered with safety to mother and child.

I do not report the number of cases delivered to date; they are entirely too few to be of value from a statistical standpoint. I have had, however, a sufficient number of cases to convince me that there is merit in this method of delivery. One case, a multipara (daughter of a physician), was delivered in fifty-five minutes. There were no lacerations.

SUMMARY OF METHOD

1. Patient must be in labor, cervix obliterated, and os dilated to at least the size of a silver half dollar. 2. Surgical anesthesia. 3. Bladder catheterization. 4. Complete manual dilatation of the vagina and cervix. 5. Patient allowed to regain partial consciousness. 6.

Pituitrin one-half c.c., to be repeated once if the pains are not efficient in half an hour. 7. Membranes ruptured. 8. Management of delivery of child as in usual case.

Remarks: I am taking it for granted that all physical findings, the presentation and position of the viable child have been made and recorded; that the patient has been obstetrically prepared, and that postpartum findings are also recorded; otherwise no comparison can be made as to the merits of various methods of delivery. Deep anesthesia is requisite to procure proper relaxation; but the anesthesia must not be continued beyond a certain point. An anesthetic, at this time, is safer; the woman being in a happier frame of mind than if given later when she is disturbed, apprehensive as to the outcome, or frenzied with pain. Gentleness, dilating both vagina and cervix (with a clock before your eyes), is essential to good results. Do not rupture the membranes until the patient is partially rational and a hypodermic of pituitrin has been given, as the bulging of the membranes aids materially in keeping the os stretched to it fullest degree. The membranes often rupture spontaneously, after complete dilatation, with the first pain, following Nature's efforts, as they are no longer a functionating object.

I have found that the patient will have far better and more regular pains if we wait until she has partially recovered from under the anesthetic before administering pituitrin. Patients in this half drowsy state will respond to your commands and aid delivery by using the voluntary muscles. If pains become too severe, she may need a few whiffs of the anesthetic, especially when the head is approaching and passing over the perineum.

Episiotomy may be performed if necessary, but it is usually not required if proper dilatation of the vagina has been accomplished.

Delivery is not always painless, but can be made almost so, judging from observation and the statements of patients. The shortening of the time of labor is very advantageous from all standpoints, and of remarkable benefit to the woman. If dilatation be complete, lacerations should not be more frequent than in ordinary cases.

It is assumed that in the giving of pituitrin obstetric judgment will be used, for its injudicious use is apt to be followed by serious injury to mother and child. Unfortunately there is not, at present, an exact standardization of dosage of pituitrin. Various manufacturers have given us ampules of different strength; for instance, Armour's and Burroughs Wellcome & Co. pituitrin preparations are said to be more powerful in action than that of Parke, Davis and Co. If the patient be completely under the anesthetic, it will, naturally, require a larger dose to obtain the desired results. When we stop for a moment and consider the vast number of cases in which pituitrin has been used,

we find very few reports of uterine rupture and death of child. If we analyze these cases, as I have tried to do, we will find one of three things. First, the case was one in which the drug should never have been used; secondly, the dosage was too large or repeated too often, or given when the patient was deeply anesthetized; thirdly, the patient was in an exhausted or septic state.

Puerperal complications and delayed convalescence, usually, have a starting point—shock, incident to mental and physical suffering. What obstetrician has not had it brought home to him that an exhausted woman is a good subject for septic infection? What a different picture, and what a different history, is the physically well woman who rallies immediately after labor, to that of the worn-out and exhausted patient, who may run the typical febrile course. A long drawn out labor, accompanied by a hot, dry, swollen vagina, offers a fertile field for infection, and it only requires a study of governmental and health board statistics to verify the statement that exhausting labor is the prime factor of high and unnecessary mortality.

This method is not presented with the idea of supplanting well known means of delivery, as demanded when dealing with malpositions, operative conditions, or with any form of placenta previa; but it is applicable to that type, classified under the head of normal presentations, when the delivery is conducted in a hospital or in the better class of homes. I present this method to you for your earnest consideration, suggestions, criticism, or approval.

19 West Seventh Street. (*For discussion, see p.* 89.)

THE CHOICE OF METHODS FOR MAKING LABOR EASY*

By Arthur H. Bill, M.D., F.A.C.S., Cleveland, Ohio

IT IS very gratifying to note the efforts put forth by those interested in obstetric progress, which aim at the elimination, as far as possible, of the terrors of childbirth. The contrast between present-day methods of conducting labor and those of ten years ago is most striking. The old plan of allowing nature to take its course, even in the face of abnormalities, with the hope that eventually the abnormality might correct itself, has given way to a far more scientific and humane method of correcting abnormal conditions, and thus assisting natural forces which act best when conditions are normal. We find also a tremendous difference of opinion as regards the relief of pain. Even those who most strongly opposed the use of anesthetics and analgesics have taken their stand with those who are exerting every effort to make the labor as comfortable as possible for the patient.

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All these efforts are worthy of commendation, and yet we must acknowledge the danger of overstepping the limits of safety when these efforts are misdirected or when unsafe methods are used. The object of this paper is to attempt to discriminate between the safer and more conservative, and the radical methods, and to select ways of relieving the pain and the exhaustion resulting from labor to the last degree, and at the same time, keep within the limits of safety.

Emphasis should be laid upon the fact that fads and hobbies have no place in obstetric practice. Let us remember that both for the relief of pain and for the termination of labor, there are several methods; that there are, perhaps, points in favor of most of these methods in individual cases; and, on the other hand, there are contraindications to them in others. Bearing this in mind, it would seem that the obstetrician, who would do the best for his patient, will familiarize himself with all of the better methods and select them according to the case in hand, and not allow himself to apply one method to all cases, regardless of the varying conditions which surround them. My efforts have been directed toward such a selection of methods and, naturally, what is to be said in this paper is based on the results of these efforts.

The problem of making labor easy divides itself naturally into two distinct parts: (a) The relief of pain, and (b) the shortening of the second stage, or the working stage, of labor.

(a) There are two general groups of methods of relieving labor pains: analgesia and anesthesia. Analgesia adapts itself only to the first stage of labor; anesthesia to the second stage. The latter is also useful in the first stage in multiparae, and as a supplement to analgesia in the first stage in primiparae. After trying various methods of analgesia, the writer has found the morphine and scopolamine method the most satisfactory, and uses it according to the usual prescribed method of small and frequently repeated doses. The one rule, which is strictly adhered to, is that no scopolamine be given in the second stage of labor, and not within a period of three or preferably four hours of the expected birth. This rule practically eliminates its use in multiparae, and in those occasional primiparae who have very short labors, with the latter exception, the method is used as a routine in primiparae. It has been found to be perfectly safe when the above mentioned time limit is carefully observed. In multiparae and the small proportion of primiparae mentioned, the general anesthetic is used instead. The time for beginning the anesthetic or analgesic is determined by one fact, namely, the suffering of the patient. In other words, something is given for the relief of pain just as soon as the patient seems to be feeling uncomfortable, no matter how early in labor. If the scopolamine and morphine method does not appear to give sufficient relief, a general anesthetic is also given with each pain.

Of the general anesthetics commonly used, we have ether, nitrous oxide, and chloroform. All will relieve pain with equal satisfaction, although there is a difference in their safety and practicability. In our practice, chloroform is not used, not that chloroform will not give the necessary relief, which of course, it will, but because it is a far more dangerous anesthetic than the others, and gives no better results. Ether is the usual anesthetic used because of its entire practicability and safety, and the fact that it gives better relaxation, which is an important factor at the time of delivery. Nitrous oxide is used in selected cases. Aside from the fact that many patients find it more agreeable, it has one advantage in the earlier part of labor, when the pains are not very forcible, in not inhibiting the pain quite as much as ether. The latter advantage is only seen in an occasional case, however, and is best illustrated in induction of labor, in which it is our custom to use gas. This, however, is a disadvantage at the end of labor. Ether is not given by the drop method, for in the relief of labor pain the best results come from giving a large amount in a short time. The closed cone is used as a routine. The second stage is one of general anesthesia. Morphine, scopolamine, ether and nitrous oxide are all used in our practice, the choice being made in each individual case at the time of labor and, except for following the general principles laid down, no definite choice is made in advance. Each method has its advantages and disadvantages in certain cases. In some cases, all are used.

(b) Shortening of labor. I am in hearty sympathy with the principle of shortening labor instead of allowing the patient to carry it on to completion by her own efforts. However, in following this plan, great caution must be urged. First of all let me emphasize the fact that efforts toward the shortening of labor should, as a rule, be limited to the second stage of labor. The first stage should not be interrupted unless there is a definite indication resulting from the condition of the mother, or, more often, the failure of the fetal heart. By a combination of analgesia and anesthesia, it is possible to allow the patient to complete the dilatation of the cervix with little suffering in a very large percentage of cases. It has been my practice for a number of years to shorten the second stage of labor by delivering the patient under complete anesthesia, and of correcting abnormalities of position when the patient has reached the second stage. The method used has depended upon the individual case being a forceps delivery or a version, according to the circumstances surrounding it. No decision as to the method of delivery is ever made in advance; for by doing so, the interests of the patient are not served as well as by going to the delivery with an open mind and deciding each case on its merits.

To give an idea of the results of this selection of methods of anes-

thesia and of delivery, I present the last 500 cases which I have personally delivered previous to September 1st, 1921, as follows:

Ether alone in	228 cases
Morphine and scopolamine, plus ether, in	192 "
Morphine and scopolamine, plus nitrous oxide in	19 "
Nitrous oxide and ether in	56 "
Nitrous oxide alone in	5 "

The methods of delivery were as follows:

High forceps	41,	inc. posterior positions conv. by forceps	32
Medium forceps	81	" " " " " "	40
Low forceps	236	" " " " " "	6
Podalic versions	71	" posterior positions	52
Breech extractions	19		130
Abdominal cesarean sections	26		
Vaginal cesarean sections	3		
Pubiotomies	3		
Craniotomy	1		
Spontaneous Births	19		
	500		

The fetal mortality in cases delivered after the sixth month of pregnancy was:

1. *Stillborn.* Nine or 1.8 per cent. Two macerated, on one of which craniotomy was performed. Three after high forceps, 1 toxemia case in which labor had been induced. One after version. Three after low forceps, after prolonged and difficult labor. Of those living and viable at onset of labor—seven, or 1.4 per cent were stillborn.

2. *Died in First Two Weeks,* Seven or 1.4 per cent. One delivered by medium forceps in case of toxemia, died during first 24 hours. No autopsy. One 6½ months' premature, lived one day. Two died suddenly on first and second days. Autopsy revealed nothing but greatly enlarged thymus in each case. One 7½ months premature with double harelip and cleft palate, lived 3 days. One anencephalic monster, lived but a few hours. One hemorrhagic baby. Autopsy showed intestines and peritoneal cavity filled with blood.

In the combined list, there were eight babies, or 1.6 per cent that died during or after the labor, and as a result of the labor. Three of these, namely, the high forceps cases, very likely, should have been delivered by cesarean section. In the case of the other five, it is not clear how the labor should have been conducted differently.

It will be noted that in 336, or 67.2 per cent of the cases presented, the head passed spontaneously through the external os while the patient was under the influence of analgesia or anesthesia. This large percentage emphasizes the success of the policy of relieving the pain, and allowing the case to take its own course to the point when the head is well within the pelvis; and, if possible, entirely through the cervical canal, unless there are indications to the contrary. To analyze

the cases further, it is well to divide them into groups: (1) Those cases in which the head was at the pelvic outlet, or well within the pelvis and in a normal anterior position. (2) Those cases in which the head lay in a vertex occipitoposterior position. (3) Cases in which the head was either in the pelvic brim or above the brim at the time of delivery, and the pelvic measurements were ample. (4) The cases of breech presentation. (5) The second child in case of twin birth.

(1) There were 271 cases in this class. Many of these would in time have resulted in spontaneous births. However, the policy followed was that of delivering them with forceps under complete anesthesia, a procedure sometimes called the prophylactic forceps operation. Experience has shown that there are several advantages in this procedure: (a) The strength of the mother is saved, and her suffering diminished. (b) The danger to the child from prolonged pressure upon its head is decreased. (c) The number and extent of lacerations of the perineum are diminished. (d) Asepsis is better maintained than when the patient is thrashing about. Preliminary manual dilatation of the birth canal, which is always performed, very materially lessens the pressure to which the child's head is subjected at the end of labor, while the complete relaxation of the patient allows the obstetrician to control the birth of the head far better than when the patient is bearing down, and it is necessary to use considerable strength to hold the head back. The delivery in such cases is simple, and very little traction force is necessary. The degree of success depends upon the care and accuracy with which the forceps are used. In their use, especial stress is laid upon the following simple rules: (a) Always make an accurate cephalic application. (b) Use axis traction so that the head will follow the course which corresponds to that of the normal mechanism of labor. In this connection I would urge the more common use of axis traction forceps, even when the head is low, for with their use, there is greater accuracy than when the ordinary forceps are used with Pajot's maneuver. (c) Take far more time than is usually allowed for the delivery, that there may be an extremely gradual birth. (d) Try to see how little force may be expended in traction. (e) Promote flexion of the head. (f) Take the forceps off and shell the head out manually as soon as the chin may be felt posterior to the perineum. While it has been my practice for some years to routinely lift the head over the perineum with forceps, I have hesitated to advocate this procedure for fear of its abuse. However, the satisfactory results would seem to indicate that greater stress be laid upon the proper use of forceps, and less upon their disuse because of damage not uncommonly resulting from careless forceps work.

(2) The occipitoposterior position. This is by far the most frequent complication of obstetric practice, and causes a large percentage of

the prolonged, painful and difficult labors. In the list of cases presented, there were 130 occipitoposterior positions, or 26 per cent. In many cases the head will rotate to an anterior position spontaneously, if the labor is allowed to go on, but only after an unnecessary prolongation, amounting to many hours in some cases. Under such conditions, the patient is working under a very severe handicap, in that the head does not tend to follow the path of the normal mechanism of labor. Much suffering and exhaustion therefore results. It is the writer's policy not to wait for the spontaneous rotation, but to correct the abnormality, when there is complete dilatation of the cervix. If the head is in the pelvic cavity, this is accomplished by rotating it with forceps, using the modified Scanzoni procedure, which I have previously described before this Society. Traction is never made upon a head in an abnormal position, such as the occipitoposterior position. After the head is rotated, we have no more of a serious problem than in the cases in Group 1.

If the head is in the pelvic brim, or above it, and in a posterior position, the choice of procedure lies between the high forceps and podalic version. In the list presented, there were 84 such cases; in 52 of them version was performed, and in 32 the forceps were used to rotate and to deliver. In my experience, both procedures have their advantage in suitable cases, and the choice between them is made at the time of delivery. To illustrate: If the membranes are intact, and the patient is a multipara, the podalic version is invariably used. If the membranes have ruptured, the uterus dry and somewhat tonically contracted, I prefer to rotate and deliver with forceps. Further, if the patient is a primipara with unusually rigid soft parts, the forceps delivery has the advantage that far more time may be allowed for the delivery than is possible in the case of a breech extraction. This must materially lessen the dangers to the child and the extent of laceration to the mother. This group comprises those cases in which the head is held up at the pelvic brim solely on account of the posterior position, cases in which the head would have readily descended into the pelvis had the position been normal.

(3) Exclusive of cases in which there is an occipitoposterior position, the head may remain at the pelvic brim even though measurements are good, for example, face presentation, brow presentation, presentation of one parietal bone, and cases in which there are insufficient or misdirected pains. For the delivery of such cases, podalic version is to be preferred. In the cases of the malpositions mentioned, forceps are contraindicated; they should never be used unless an accurate application is possible, and the head can be made to descend in the manner in which it descends in conformity to the normal mechanism of labor. This is not possible in the case of the abnormal positions mentioned.

(4) Breech presentation, especially the frank breech. Too often the patient is allowed to continue for a long period in the second stage of labor in the hope that the breech will descend spontaneously. The patient may be entirely relieved of this unnecessary prolongation of labor, and nothing is to be gained by waiting for spontaneous descent. The preferable plan is to bring down the feet and extract without further delay when dilatation is complete.

(5) In twin births, the second child is immediately delivered by version. There is no excuse for the long interval sometimes occurring between the births of twins. The conditions are never more ideal for version than in the case of the second twin.

It will be noted that in the list of cases presented, there were only nine high forceps cases if we exclude the occipitoposterior positions. These were cases in which there was a moderate dystocia and indications for delivery were present. Every effort is made to reduce the use of high forceps in such cases to a minimum.

Any plan of shortening labor may be abused. The abuse lies chiefly in too early attempts at delivery. From my own experience, and from observation of the work of others, I believe that the one great cause of failure may be attributed to the cervix; that is, attempts at delivery are made when the cervix is not completely obliterated. Its resistance may be the cause of disastrous results, whether version is performed or whether forceps are used. Manual dilatation of an undilated cervix is often insufficient. Hence, the stress which I have laid upon the importance of waiting whenever possible for the head to pass through the cervical canal, or at least for the complete obliteration of the cervix.

It is possible to so simplify labor that women will not look forward to it with dread. The part which the patient takes in labor is largely a passive one, consisting chiefly of breathing the anesthetic as directed. She is seldom urged to strain or pull. Pulling straps are never used. The results of our efforts as described, as shown by the relatively low fetal mortality, furnish ample justification of these methods. The conservation of strength is a great benefit to the patient during the puerperium, while the apparent lack of fear with which they anticipate labor, materially lessens the common nervous symptoms of pregnancy including nausea and vomiting.

In conclusion, let us remember that all obstetric cases are not alike, that neither the same method of anesthesia nor the same method of delivery offers the best solution for every case. We have various methods and most of them have their peculiar advantages for individual patients. Let us become proficient in each, and be ready to use the one which best applies to the case in hand.

503 Osborn Building.

(*For discussion, see p.* 91.)

REPORT OF A CASE OF HEMIMELUS OR SO-CALLED CONGENITAL AMPUTATION*

By Harold Bailey, M.D., New York City

FOR many years deformities showing absence of part of a limb have been reported as intrauterine, spontaneous or congenital amputations, but hemimelus (half-limb) is a better term; for while it discloses nothing as regards etiology, it does not perpetuate the idea that the limbs have been amputated during embryonal or fetal life. These cases are not uncommon in the minor degrees, that is, the absence of the fingers or toes, but the presence in the living child of congenital malformations involving the entire limb is sufficiently rare to demand a description with a view of determining the etiologic factors or ascertaining by the study of the associated malformations, the developmental period at which the structural defects occur.

The malformation known as hemimelus consists in the absence of one or more of the four extremities, the distal end appearing as a healed stump and simulating the result of a surgical amputation. The stump of these extremities is usually thought to contain no developmental factors of the parts below. However, in recent years our ability to obtain x-ray plates of these lesions has produced evidence that many have a portion of the bones distal to the defect.

Before we take up the description of the case at hand, we should recall that there are other congenital malformations involving the bones of the extremities. For instance, in that rare condition, phocomelus, there is an absence of the proximal bones, the hands and feet springing from the rudimentary arm or leg, or directly from the trunk. These monsters are rare but are common enough to find their way into "sideshows," and are then usually designated as the "turtle-women" and so forth.

Examination has shown that in the short stump there are often cartilaginous rudiments of the absent bones. The absence of the long bones is fairly uncommon. However, Dr. Stafford McLean has under his care at the present time in the Babies' Hospital an infant two weeks old that has the right femur absent. The x-ray shows that the bones of the lower extremity are attached directly to the pelvis. It is apparent that these malformations of the extremities, while much more frequently occurring at the distal part, may involve the proximal bones.

*Read at a meeting of the New York Obstetrical Society, October 11, 1921.

CASE REPORT.—(No. 16089. Manhattan Maternity Service.) The mother is Polish, thirty-six years of age and Wassermann test was negative. She had three previous normal pregnancies. The children are living and have no deformities. Labor occurred on September 12, 1921. There were slight pains at ten-minute intervals for two hours, then three stronger pains and a 7½ pound baby was born.

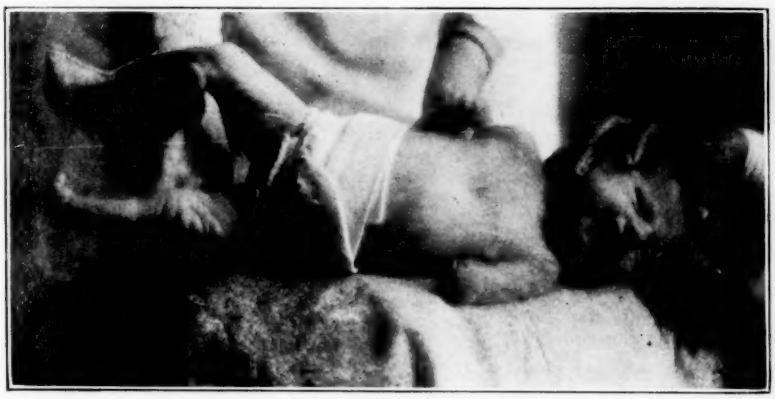

Fig. 1.—Absence of the left forearm. Note the small tab of tissue on the inner side of the stump.

Fig. 2.—Stump of left arm showing bony growth below the elbow.

Fig. 3.—Stump of left leg.

On the arrival of the intern from the hospital, the baby and placenta were found in the bed. The placenta and membranes were apparently normal. The child had a paralysis of the left side of its face, which from the wide open eye might be considered as an external paralysis of the seventh nerve. The left arm was terminated at the elbow, with a smooth padded stump. In the tissue of the stump, the x-ray shows the evidence of bone growth which must come from the ossification

centers ordinarily placed in the shafts of the ulna and radius. The olecranon and the joint ossifications do not occur at this early stage and it would appear that the bone in the stump represents rudiments of the bones of the forearm. When the child contracts its biceps, there is flexion as of a joint. There is a bud or spur of tissue attached to the inner side at the elbow joint. The left leg ends in a stump composed of the tibia and fibula. Below this is a mass of tissue somewhat resembling the heel and in the front end is a bud or spur which is like the big toe. The x-ray shows no bone below the tibia and fibula. There appear to be no other deformities. The child is a month old and gradually gaining weight. (Figs. 1, 2, 3.).

MATERNAL IMPRESSIONS

One of the older theories of these defects still held by unscientific persons is that they are the result of maternal impressions occurring at any time during pregnancy. It is interesting to note the coincidences that further such false ideas. In our case, there were family difficulties and all through the pregnancy there was discord. The husband now charges the wife with being the cause of the amputations because at one altercation while she was six months pregnant, she chased him about the house with a butcher knife. The wife does not deny this and even believes that she may have caused these deformities. The discussion ended in the Court of Family Relations.

AMNIOTIC BANDS

General credence has been given the theory that these malformations were actually amputations from the constriction by amniotic bands. There are cases in which adhesions have been found attached to the head (I have such a specimen in the Cornell Museum), to the face, and to the fingers. There are many cases with deep grooves on the limbs commonly thought to be due to constricting bands. An entire theory of teratogenesis is built upon the fact of amniotic adhesions.

There are two articles in the older literature which describe amniotic cord-like bands attaching an undeveloped foot to a stump of the limb. In the more recent literature, Fieux[1] describes the hand attached by a cord to the stump of the arm. It is possible that the maldevelopment of the extremities is the result of amniotic pressure in the first few weeks and that the bands are adhesions of the amnion to the open or inflamed area.

These grooves are in all instances located on the limbs. They are never spiral and no amniotic band has ever been found attached to them. Ballantyne[2] believes the deformities are due to a faulty development of the amnion, whereby it remains in contact with the embryo, thus producing pressure. This explanation of course refers to the first weeks of embryonic life.

A skiagraph tracing, presented by Truman Abbe, of the hands in a case of so-called intrauterine amputation shows the two stumps of the first and third fingers contain rudimentary phalanges. At the base of

each short finger is a deep groove and another occurs at the level of the metacarpal bones. The x-ray proves that these fingers are not amputated but are undeveloped. The skiagraph of the apparently normal hand shows that the condition is partly bilateral for the terminal phalanx of the first and third fingers is rudimentary.

In a case reported by William Stowell[4] there was a deep circular groove on the left leg just below the knee and a shallow circular groove in the lower third of the right leg. This infant had in addition a club foot on the left side and webbing of the toes. The right hand showed amputation of the fingers and there were deep grooves about the base of the little finger constricting the soft parts nearly to the bone. The left hand had syndactylus or webbing of the fingers.

The presence of bud-like growths on the more or less conical stumps has been often noted. They are usually supposed to represent fingers or toes. In Watts'[5] case of absence of the ulna a rudimentary finger with phalangeal bones cropped out below the elbow, as if nature had attempted to complete the hand. In my case, the padded stump quite resembles the heel and the big toe.

It is evident that most of the cases have other malformations. In our case there was an external facial paralysis. As this baby had no forceps procedure and was the result of a precipitate labor, it is difficult to determine the origin of this condition. A similar condition is described by Guyl in a case of hemimelus and he attributed the paralysis to the pressure of amniotic bands upon the seventh nerve.

EXPERIMENTAL TERATOGENY

Experimental teratogeny has advanced since the time of the Saint-Hillaires until now every type of developmental defect known in the literature may be produced by experimental treatment. Stockard[6] and others have found that monsters may be artificially produced in the fish and chick embryos by changes in the moisture, temperature, oxygen supply or by the production of an excess of CO_2. The structural changes in defect or excess are due to variation in the developmental rate at a time when the organ so affected is in a rapid proliferating stage. Stockard believes that each organ or part has a distinct moment or time when it has the advantages of growth and that it actually inhibits the growth in other parts. When its own proliferating stage has passed, it does not appear again in such ascendency. If the changes in the temperature or oxygen supply cause a slowing of the rate during the embryonic phase of the organ, it is unable to make up for its loss and the resulting deformities are always secondarily due to this slow rate of development.

Such an explanation of growth and development applies to the time when the blastodermic vesicle is in the act of attaching itself to the wall of the uterus. Very considerable conformation of this general theory is evident in the human embryo. By the studies of Mall[7] of

one thousand cases of anomalies of embryos from the uterus, ectopic pregnancies and stillbirths, it was found in the ectopic specimens that there were twice as many pathological as in the uterine. He believes that this is due to faulty implantation and consequent malnutrition.

HEREDITARY FACTORS

Mall states that so-called congenital amputation anomalies should be considered as a separate class, as yet unexplained, but indicating that hereditary or germ effects may have an influence in their production. Stockard believes that in these forms of amelia, the hereditary factors are involved and it is well known that one form of anomalies of the extremities, that is polydactylism, is inherited.

From this consideration of the subject, it would seem that the word amputation does not express the condition at all and that the actual state of affairs is either an inherited structural defect or one due to faulty development in the earliest embryonic period.

SUMMARY

We have definite knowledge that almost any form of monstrosity may be produced experimentally in fish and chick embryos by cutting down the oxygen supply or by some means of irritation. In the human embryo a large number of monsters have been found in ectopic pregnancies, where it is known that there is faulty implantation of the blastocyst and a resultant diminution of the oxygen supply.

As regards the extremities, the abnormality may consist of the absence of the proximal bones, the distal bones being normally formed and joined directly to the skeleton. In these so-called amputation cases where the distal extremity is absent as the forearm or foot, there are invariably other malformations. In the stump of the forearm of this case, the x-ray shows the presence of undeveloped bones arising apparently from ossification centers normally placed in the missing parts. The same condition has been noted by Truman Abbe in a case that had seeming congenital amputation of the fingers. The skiagraph shows the bones to be present but undeveloped. The bud-like spurs resembling the lost parts or portions of them may be present at the joint above as in Watts' case or may be mere projections simulating the absent soft parts as in our case. These spurs represent an apparent attempt by nature to continue the normal development.

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22 EAST SIXTY-EIGHTH STREET.

(*For discussion, see* p. 98.)

Society Transactions

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS. THIRTY-FOURTH ANNUAL MEETING HELD AT ST. LOUIS, MO., SEPTEMBER 20, 21, AND 22, 1921

THE PRESIDENT, DR. HENRY SCHWARZ, IN THE CHAIR.

DR. JOHN N. BELL, of Detroit, Mich., read a paper on **Diabetes and Pregnancy.** (For original article see page 20.)

DISCUSSION

DR. IRVING W. POTTER, BUFFALO, N. Y.—I can report four cases of pregnancy occurring in diabetic women. The first was a woman who had undergone reverses and while three months' pregnant went into a state of coma, following a long period of mental and physical exertion. She was brought to me by a physician, and I refused to terminate the pregnancy. Possibly if I had she might have been alive. Another case came from Toronto, a distinct type who went into labor at full term and was delivered of a dead baby. She went on to recovery but still has her diabetes. Another case was a true diabetic, with a brother who was diabetic and was treated for years for the disease. She also lost her baby. The fourth case was the daughter of one of our most prominent families whose father was a diabetic, and an uncle who was a diabetic has since died of the disease, but she was carried along through the entire pregnancy, and was delivered by myself of a perfectly healthy baby at full term. She, however, shows a considerable amount of sugar in the urine and is very rarely sugar free.

DR. M. A. TATE, CINCINNATI, OHIO.—Some ten years ago I presented to this Association a paper on glycosuria complicating pregnancy. One of the two greatest advances in obstetrics, as brought out by Dr. Bell, is prenatal care. Every pregnant woman when she consults a physician should receive a most careful examination, particularly of the urine. If we have a case of true diabetes, the patient having suffered for a number of years, that patient should not, in my opinion, be allowed to go on to full term. If we have a temporary glycosuria that patient can be carried through by appropriate treatment.

DR. BELL (closing).—It seems to me it is a question of just how long before term we should believe a patient could be carried to term with modern treatment. I had hoped that some of the members would discuss that point. For instance, a patient presents herself, as in my case, four or five months before term: will you, knowing she has a true diabetes, attempt to carry her to term or will you not? This case, of course, may have been an exception and had a very fortunate outcome, but I believe we should make some effort to carry these women to term in the hope that they will come through all right.

DR. WILLIAM G. DICE, of Toledo, Ohio, read a paper on **Heart Disease in Pregnancy**. (For original article see page 24.)

DISCUSSION

DR. JOHN OSBORN POLAK, BROOKLYN, N. Y.—In the discussion of this excellent paper I wish to emphasize a few points.

First, the importance of prenatal care. In following some 5,000 cases in our prenatal clinic we found that 2 per cent presented heart lesions. In other words, there were 100 cases that had definite heart lesions. I do not believe that the internist has an appreciation of the surgical heart or the obstetric heart. It is the man who is following the case from day to day and from week to week in his prenatal work who is the best judge of the woman's cardiac force. It is not a murmur, as the Doctor has said, but the muscular force and action that must be considered in determining whether this woman is capable of going on with her pregnancy or whether it must be terminated. It is interesting that in these 100 cases there were only five that needed interference. Three had cesarean sections and two, after rest in bed with no improvement, were delivered in the early months by abdominal section, with sterilization.

We believe that section is the preferable way to empty these uteri and that these patients stand operative procedure better than they do induction of abortion, as the nervous element in all these cases is very marked. In other words, by anoci-association and plenty of morphine, scopolamin and gas, one can deliver these women at three or four months by abdominal hysterotomy, sterilize them and have better results than he can by producing abortion. That may seem odd, but it is a proved fact.

Another point is that repeated pregnancies jeopardize the patient's life and her longevity. We therefore feel that where we are able to carry a woman to term and she does not spontaneously deliver, and spontaneous labor relieved with the free use of scopolamin and morphine, supplemented with low forceps in the second stage is our choice, a cesarean section with sterilization is the safest procedure.

The next point of importance is the management in the third stage. These patients will often go through the first part of the labor and collapse in the third stage. This, I think, can be prevented by: First, use of abdominal pressure in the form of heavy sandbags; second, bleeding to relieve the right heart, and third, vigorous stimulation at that time.

Finally, these heart patients do not need as much digitalis as the internist usually thinks. They do better with rest and small doses of morphine than they do with heroic treatment.

DR. GORDON K. DICKINSON, of Jersey City, N. J., read a paper entitled **The Breast Physiologically and Pathologically Considered with Relation to Bleeding from the Nipple.** (For original article see page 31.)

DISCUSSION

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—This paper calls our attention rather directly to the etiology of cancer. It should be remembered that this gland is decidual. Its period of functioning is an active one and it is constantly subject to traumatism: therefore: inflammatory lesions very commonly develop. The connection between the functioning of the organs of gestation and the breast has been made clear in my paper. Vicarious menstruation often occurs during periods

of suppression, or at least the breast is liable to show congestion, if not actual bleeding. The blood vessels about the nipple, many of them, have very thin walls, and if subjected to an active congestion it is easy to see how rupture can take place.

The cell normally has three stages to pass through: The developmental stage, the stage of maturity and the stage of senescence, and under congestion the period of development is gradually increased by the nutrition brought to the part. The growth impulse is intensified, but without adequate differentiation of cells and tissues. These cells do not all mature and the cell passes through the developmental stage directly into senescence.

In normal tissues or those with ability to return to a status of essentially normal function, a certain number of cells always fail to reach maturity. In tissues of decidual and vestigial character and in tissues undergoing the vicissitudes of inflammatory change, the number of immature cells is greatly increased. In cancer there are but few cells that reach maturity. Their number is never large enough to differentiate a tissue capable of more than very incomplete function.

DR. ROLAND E. SKEEL, Los Angeles, Cal.—Dr. Dickinson's paper is rather difficult to discuss in a few moments, largely because of the great number of subjects he has covered, but there are two things of which I wish to speak.

First, I wish Dr. Dickinson in closing, to say a little more about the psychic origin of any tumor. Some of us, I think, would find difficulty in subscribing to the theory that any tumor had its origin in the psychic field, although many of us are willing to believe that the psychic field has been indifferently explored as yet.

The second thing was not brought out, I think, and is really very important. Dr. Dickinson mentioned the importance of early diagnosis and of early surgical treatment of any condition producing bleeding from the breast, but the important thing about the benign tumor of the breast is that so many general practitioners advise a young patient to let a benign growth alone.

Has it not been the experience of every one in the room to have patients come to the radical operation for carcinoma who have had an adenoma for many years before? They are so accustomed to the small growth that the early development of cancer means nothing to them, and how often are we startled after removing a supposed adenoma to find that the microscope shows a beginning adenocarcinoma and our minor operation is a failure instead of a success. The woman of forty or forty-five who develops a lump in the breast, will probably consult her physician without delay, but the woman who is accustomed to the presence of her little adenoma will allow several months to elapse before doing so.

DR. AARON B. MILLER, Syracuse, N. Y.—A patient came under my observation with a history of bleeding from the nipple with each menstrual period. I looked over the literature and found it was very unwise to allow a condition of that kind to remain, that the probability was it would become malignant, and the thing to do was to operate early. After seeing the patient several times I found she had spent considerable time in New York City and had been shopping around the country with the advice that it should be taken care of at once, otherwise, serious conditions would probably develop. She remained under my observation for some time but continued to keep her breast, despite my advice to the contrary and she has just sailed for Europe. During each menstrual period bleeding occurs and if the breast is pressed several drops are exuded. This is merely a matter of clinical experience.

DR. CHARLES W. MOOTS, Toledo, Ohio.—For a number of years I have been a member of the Cancer Committee of our State Association and it has been my duty to go out into the highways and byways and talk cancer. Unfortunately, we find that the general practitioner needs educating more than the public. The public will listen and this is what occurs: the women after hearing these talks take their

so-called benign tumors to their family physician and he tells them if it has never hurt them to let it alone. That is universal and I wish the men of this Association would help those of us who are working along these lines to get these men to stop that sort of advice. I am sure if we are to get anywhere in cancer we must operate on these cases in the precancerous stage. At least the patient must be put under expert service to determine whether or not the growth is cancerous.

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—Last year I read a paper on "Benign Mammary Tumors and Intestinal Toxemia" before this Association, and also one on "The Human Breast—A Plea for Well Directed Treatment Based on a More Accurate Diagnosis", before the Tri-State District Medical Association. The subject under discussion is so important that I feel it necessary to say a few words in emphasis of certain points.

I fully agree with the last speaker that the education is necessary not so much of the public as of the profession. I want to agree with all that has been said, but I feel it compulsory to raise a flag of caution. The layman is between Scylla and Charybdis, he has been told that every tumor is essentially malignant and should be cut out inside of forty-eight hours after its appearance. Such a statement was made before this body by one of our colleagues two years ago. Others say: "Let the tumor alone." Certainly the layman is in a difficult position. Much harm will result if there is a strict adherence to either one of these dogmas.

The examining physician must be educated to the point where he will be able to differentiate between a tumor of the breast which has become a cancer, and the "lumps" which may come from the toxemias, thyroid dyscrasia, acidosis, etc.

In my paper on "The Human Breast, etc.," I drew the following conclusions, and it may not be amiss to repeat them here:

1. The laity is coming earlier, in increasing numbers, for examination.

2. Opportunity for service, on the part of the medical profession, is being increased in proportion as the public responds to its summons.

3. The profession must develop a higher degree of diagnostic ability than in the past and possess itself of all the essential facts concerning breast conditions.

4. A judicial attitude must be maintained—careful examination with well-poised judgment.

5. Accurate diagnosis of abnormal breast conditions means and demands a careful systemic survey as well as an efficient local examination.

6. The human mamma may be the seat of changes purely inflammatory or of neoplastic nature, closely simulating malignancy.

7. The relationship between the internal genitalia and the breast has been well established. Correction of abnormal pelvic conditions may ameliorate or relieve certain mammary changes.

8. The relationship between chronic intestinal stasis and certain breast conditions seems to be proved. Toxemia from teeth, tonsils and other parts of the body may also have its effect upon the mammary gland.

9. Serious conditions are often overlooked while they are as yet amenable to the simplest measures of nonsurgical treatment.

10. The use of the terms "breast" and "mamma" as synonymous may increase the difficulties of diagnosis. The writer believes it would be helpful to confine the term "mamma" to the gland with its ducts, including its outlet, the nipple; "breast" as embracing the entire mamma with all else that surrounds it—the skin, fat, fascia, capsule, and the bed upon which the gland rests, the fascia, muscle and bone with cartilage, in juxtaposition to the mamma.

11. Any of these structures may be diseased, and multiple pathologic lesions present, rendering diagnosis more difficult.

12. Abnormal conditions, congenital or acquired, may be present in neighboring

structures, and lead to wrong diagnosis of cancer, or if malignant disease is present, lead to the diagnosis of the inoperable and incurable stage although the neoplasm is early and surgically curable.

13. In spite of present knowledge, it is impossible at times to arrive at an immediate accurate diagnosis. In justice to the patient it may be necessary to keep her under careful observation, treating general conditions, before proceeding to radical surgery. If, then, mistakes occur, it should be the earnest endeavor of the profession to make them fewer and fewer.

14. It is reasonable to assume that with the early recognition of some lumpy conditions of the breast, followed by adequate systemic treatment and mechanical support, underlying factors of malignant disease may be removed.

15. A question naturally arises: If all the foregoing is true, may it not be that in that multiplex disease grouped today under the term "cancer," there are possibly causative factors underlying malignant disease in the toxemias and the heterological activity of the endocrines? This seems to be a very promising field of research.

16. When cancer is present beyond a reasonable doubt, radical surgery is absolutely indicated.

To allow a patient to drift beyond the hope of surgical cure is a terrible tragedy; to unnecessarily and radically remove a woman's breast may be a profound calamity. With a deep sense of the limitations in the art of exact diagnosis and of the greater responsibility today in the enlarging field of service for humanity, let the profession be ever guided by the watchword, "Not Fears But Facts."

DR. DICKINSON, (Closing).—Replying to Dr. Skeel, I did not mean that the psyche made tumors, but will induce a congestion of the parts and in that way indirectly produce them.

As to Dr. Bainbridge, if you watch and wait, with all the acumen you have, you may yet be mistaken, as I was on one of my recent cases when I found that the cancer had started.

I wish to put two things on record: First, this paper was instigated by a remark of Dr. Rodman's several years ago—I respect the memory of Rodman so much that I like to mention his name. Another thing: Two years ago I developed a lump in my left breast about the size of my fingernail, psychologic, I think. (Laughter). Anyway, it came; it was tender; everything that touched it hurt it. I tolerated it for a while, then went to my local friends, who said, "Go to Deaver." I went, he examined it and told me to come back in the spring, and if it had not disappeared he would remove it. It had disappeared. It was a natural lump, without any cause apparently except that I may be unusually nervous, quick, given to emotions, and it struck me locally.

DR. PALMER FINDLEY, of Omaha, Neb., read a paper entitled **The Slaughter of the Innocents.** (For original article see page 35.)

MR. ERNEST F. OAKLEY, JR., St. Louis, Mo., read a paper on **Legal Aspect of Abortion.** (For original article see page 37.)

DR. H. WELLINGTON YATES AND DR. B. CONNELLY, of Detroit, Mich., read a paper on **Treatment of Abortion.** (For original article see page 42.)

DISCUSSION

DR. GEORGE C. MOSHER, KANSAS CITY, MISSOURI.—There are two or three things which I should like to call to the attention of the Association.

In the heart cases, I always took the position that these cases in the absence of hemorrhage or loss of weight should be kept under observation. I have in a measure changed my view in this way but still maintain that a certain number will go through pregnancy and not lose their lives.

Another thing is the symptom of pernicious vomiting as a reason for abortion. We have had seventeen cases in the last two years of which fifteen have been carried through to the termination of pregnancy.

Third, the plan of operation. In five years, from 1909 to 1914, in the Kansas City General Hospital in which I have part of the obstetric service, statistics under the use of the curette during that time showed that the average length of time of each patient in the hospital was twenty-two days. From 1914 to the present, in which period we have adopted the conservative method of treatment and the curette has not been used once, the average time in the hospital has been eight and one-third days. The average cases of complication in the old days was 70 per cent, and our average since using the modern method of treatment has been only 5 per cent.

DR. EDWARD A. WEISS, PITTSBURGH, PA.—Several years ago I presented a paper before the Association which brought forth rather violent discussions, especially by Dr. Skeel. Since then I have not changed my views, basing my beliefs chiefly on hospital work. It is rather strange that with all the advances in hospital and medical affairs we continue to stand still in the much abused and time honored so-called "therapeutic abortion." Physicians who will go almost to any limit to secure a good result in other cases, will produce an abortion on the slightest provocation. I thought that perhaps I was rather extreme on this subject, but one of my internes told me that his former teacher in obstetrics had fifteen distinct indications for therapeutic abortion, not counting many others that may be supplementary. Is it any wonder then that so many abortions are being performed by the laymen and the quacks when we, as a profession, give them so much leeway and encouragement?

I regret that papers should be read by members of the Association advocating abortions on rather restricted grounds. In twenty years I have never seen a patient die from hyperemesis gravidarum.

In a period from 1910 to 1920, some 114 cases were admitted in my hospital service for interruption of pregnancy. In not one was an abortion performed, and not one of the women died. These were not ordinary cases, such as the usual vomiting of pregnancy, but came under the classification of hyperemesis and other more or less serious conditions. So it seems to me that as a Society, composed almost entirely of teachers in medical schools, or at least heads of departments where we have a large number of internes under our care, we should be extremely careful in giving out these indications for the so-called therapeutic abortions, and further I would like to voice my emphatic protest against advocating abortion in early tuberculosis or mild heart conditions, for I have seen cases carried through, even with pyrexia and loss of weight, and go on to a happy termination and normal delivery.

DR. M. P. RUCKER, RICHMOND, VIRGINIA.—I wish to say a few words about the criminal aspect of abortion. The law is plain enough, but the trouble is, that it is difficult to apply the law in an individual case. I would like to cite an instance that occurred several years ago in Virginia. The students who saw the case first made a diagnosis of puncture of the uterine wall and sent the patient up to the hospital and immediately went up to the detective office to get to work on the legal end of the case while the hospital took care of the medical side. They finally ferreted out the woman who produced the abortion and the crochet needle she had used for the purpose. She made a confession. This happened in January and the

trial was postponed until the summer. One student who lived in a distant state had to come back to the trial, at great expense and inconvenience and said he was cured of ever taking part in a criminal abortion again. The woman was bailed. She disappeared and was not produced. This is not an uncommon complication in these cases and is possibly one reason why the medical profession is so loath to take any part in them.

DR. GORDON K. DICKINSON, JERSEY CITY, N. J.—I would like to mention two points very briefly. In the literature, Myer speaks of the great prevalence of abortion in unwashed Rome. I think it has been the habit ever since. It was probably no more prevalent then than now, and it is probably no more prevalent now than it was then.

We control it in New Jersey by having the midwives licensed, and requiring them to be re-licensed every year. If we have occasion to suspect any one of them but cannot obtain full evidence to convict, the license is revoked the next year and she is put out of business.

DR. HUGO EHRENFEST, ST. LOUIS.—I wish to add a few remarks to the points brought out by Dr. Rucker. Some years ago a friend of mine was prosecuting attorney of this city and he had an idea that a group of medical men could help him in the prosecution of such cases. The result was most unsatisfactory. We were supposed to be *ex-officio* experts for the prosecutor any time he wanted us. I remember one instance when we had the midwife there, the fetus, the catheter and the patient on whom the abortion had been performed. It looked like a perfect case. I was put on the stand and the first question asked by the lawyer for the defense was: "Doctor, do you qualify as an expert in abortions?" (Laughter.) I tried to explain but was forced to answer his questions with "Yes" or "No." And so he made me confess that I had produced several abortions. I had no opportunity before cross-examination to explain that they were all therapeutic. He then asked if I had ever lost any of my abortion cases and I answered "No." He then said, "You are an expert in abortions, go ahead." (Laughter.) We had many such experiences. I have been told by an expert criminal lawyer that the average man on the jury is afraid of the accused midwife because she might know that once his own wife was helped out by her. We could work out the cases any way we wanted to, but we could not get a conviction. I would like to ask Mr. Oakley to tell us concerning the results achieved with our very excellent Missouri law. I should like to know whether there is any midwife or physician in jail in this state; whether there has been for the past ten years, and whether or not prosecutions of these criminal abortion cases do not resemble very closely those under the Volstead Act.

MR. OAKLEY, (Closing on his part).—Of course Dr. Ehrenfest could qualify as an expert on abortion in theory but not, necessarily, as an expert on abortion in practice. The doctor must distinguish between a therapeutic abortion and an abortion in its unlawful or illegal sense. The respect in which he qualified as an expert was as a therapeutic abortionist, I trust, and not in the other way.

The doctor also said something about its being difficult to secure conviction and, in that respect, I take issue. The case is very simple. All that is necessary for the State to allege and prove is the fact that the woman died from peritonitis and general blood poisoning superinduced by a criminal abortion. This must be testified to by the attending physician who was present during her illness and at her death. The other element that is necessary is that an abortion had been performed upon this woman. Although the attending physician did not perform this abortion he has to testify to the cause of death and is disposed of. The autopsy physician is the one who states under oath that an abortion has recently been performed upon the woman; that, in conjunction with the fact that she died of peritonitis, that, al-

though the woman was pregnant, it was not necessary to operate upon her to save her life or the life of the unborn child, is enough to prove the State's case; and these three things are easily and quickly proved. I recall one case in which I had the dying statement of the woman. The general dying statement is not sufficient. The declarant must be under the impression that she is about to die. She must realize this. She must say: "Yes, I am going to die." If you gentlemen will recall this: if, in an emergency, you have any occasion to take yourselves a dying statement, base this upon that question and also upon the following question:—"Have you abandoned all hope of recovery?" and it is safe to say that there is no court in the United States that would not take your testimony. Then she names and states where she went, with whom she went, and what was done to her, and who sent her to this particular man, if a physician; or to the woman, if she be a midwife. In the particular case in which I testified, the dying statement was opposed by counsel for the defendant on the Constitutional provision that the accused must be confronted by the accuser in open court, and it was held by the Court that the accuser in this case was a dying woman, and because of that fact she could not be produced as a living witness against him. But we begged the point, and it was held that it was not the dying statement but the individual who was offering the dying statement who was the accuser, and the defendant was being confronted by the accuser inasmuch as I took the statement. I was cross-examined as to when, why and where this statement was obtained and in the various legal aspects he had offered. In that case the autopsy physician, unfortunately for the case, fell down. He was not quite sure whether or not an abortion had been performed and was the cause of the peritonitis. He did not know the date and could not tell whether it was a recent or an early affair in the life of the woman, and it was on his testimony that the case went up to the Supreme Court. That Court held that the dying statement was admissable, but that it was not according to the Missouri Constitution corroborated by the positive statement that an abortion had been performed on the woman, resulting in peritonitis and her death, and for that reason the case was remanded and sent back for retrial.

The elements constituting the criminal charge are quite simple, and you will find that no prosecutor will allow his office to issue any information in which he is not positive he can make out a *prima facie* case against the accused.

Another part of the discussion that I listened to—some of the jurors may have employed the midwife, and an aspersion was cast upon the wife of the Prosecuting Attorney in that respect. Now, gentlemen, that may be true. It is analogous in my mind with the prosecution of liquor cases and in the City of St. Louis for the State of Missouri I have the whole jurisdiction. Yesterday I obtained my second indictment, and yet I hold the record for the State of Missouri! (Laughter). They assign different reasons for the failure to convict, but the main reason is that we are all drinking men and therefore we should stand together. That is the attitude of the twelve men trying the defendant, and the physicians, I think, often hesitate, either because of their own particular interpretation of their ethics or because they are afraid of a damage suit, to divulge this information. It is not necessary for a physician to go to an attorney and say: "My patient has been operated upon and Dr. Jones did it", or "Mary E. Smith did it". No, that is not necessary. But it is his duty to go to the coroner in some jurisdictions, and to the police or sheriff in others, and inform that authority what he has found, which to his mind, speaks for abortion of a criminal aspect. That is his duty and after he has done that the authorities can go to the bedside of the patient and, if they are lucky, they will get a statement. I believe that dying statements are secured in perhaps four out of ten cases. It has been my experience that the woman, although she is at the point of death and knows it, to the very end will hold out and refuse

to divulge the name of the individual who is responsible for her condition, because she looks upon that individual as her friend. I have in mind an individual who was kept alive by a physician for two weeks longer than she should have lived, but who refused absolutely to make any statement as to who was responsible for her condition, even though she knew she was going to die.

DR. CHARLES E. ZIEGLER, of Pittsburgh, Pa., presented a paper on **Additions to Our Obstetric Armamentarium.** (For original article see page 46.)

DISCUSSION

DR. EDWARD A. WEISS, PITTSBURGH, PENNSYLVANIA.—Regarding the clamp the doctor has described I will say that this is one of the appliances we have been using in our department for some time, with very satisfactory results. From the picture one would think it was rather complicated, but it is quite simple and has a great deal to recommend it. A cotton, not a gauze, pad between the clamp and the skin, it really absorbs the moisture and makes it very efficacious. The cord is mummified and drops off after seventy-two hours.

DR. JOHN O. POLAK, BROOKLYN, NEW YORK.—These devices of Dr. Ziegler's are very ingenious. Personally, I feel that the clamp is rather complicated and that it might be difficult to use. As a rule, we are all trying to make obstetrics just as simple as possible, and we have all gone through tying off the cord and burying it, as suggested by R. L. Dickinson several years ago, and have tried various ligatures, yet the fact stands out that the clamp is the most satisfactory method of treating the cord. This clamp, if it has the advantages Dr. Ziegler claims for it, certainly deserves a more extended application.

Regarding the wristlet, there is no doubt that it is very good, but there is a chain necklace on the market at present that is really so simple that we cannot see the use of a more complicated and expensive device. The baby's name is threaded in lettered beads on an ordinary trout line and the necklace is put about the neck and sealed and clamped before the child leaves the delivery room. In that way the baby's name is stationary and when the child is sent down to the office for discharge the family either buy the necklace or they cut the necklace off. Recently we have had the lettered beads painted with radium paint so that they may be seen in the dark.

DR. ZIEGLER, (closing).—I have little to add except to say that the clamp is very simple when you come to use it. Perhaps the pictures have made it appear more complicated than it really is. I am finding it very satisfactory and am never in doubt as to results.

In regard to the necklace mentioned by Dr. Polak, I am familiar with it. The principal objection to it is that the letters do not remain in alignment. The name is therefore at no time in full view and is accessible only through spelling it out by adjusting each bead in its turn. The lettered beads, moreover, are usually to be found behind the baby's neck or back.

As to the wristlet: The pictures and detailed descriptions of the parts of the wristlet, appear to have complicated it. It is in fact very simple. My own opinion in regard to the sealing device, is that in most hospitals it will likely be regarded as unnecessary. As the wristlet is put on by stretching the band, its removal requires some little trouble. Nurses and other attendants have no object in deliberately removing the marks of identification from one baby and putting it on an-

other. However, the sealing device is there if wanted; if not, it may be left off. With the wristlet, the name is in plain view at all times. The name label being covered with the celluloid shutter and in a sealed compartment, is effectually protected against mutilation or soiling and cannot be removed while the wristlet is on the arm. Even boiling does not affect the legibility of the name; it only serves to seal the compartment the more effectually, through the expansion of the celluloid.

DR. ARTHUR M. MENDENHALL, of Indianapolis, Ind., read a paper entitled **Teaching Undergraduate Obstetrics.** (For original article see page 53.)

DISCUSSION

DR. O. H. SCHWARZ, ST. LOUIS, MO.—In this very important paper we all more or less agree with what has been brought up. It is very important that in the future if obstetrics is to keep pace with medicine and surgery so far as teaching is concerned, this branch will also have to be put on a full time basis. Such a condition will undoubtedly improve the Out-Patient Department as far as teaching is concerned. In most instances such departments do not get the proper supervision, and certainly a full time man will be able to supervise such departments better than men who are also engaged in private practice. We are now attempting to have at least an interne present at each delivery, so that he can instruct, in some measure in these cases.

The ideal thing, of course, is a maternity hospital, with a number of beds available for teaching purposes. Fifty beds would probably be more than sufficient.

I do not believe that manikin practice needs so much attention as has been pointed out. I believe individual work with the patient will do much more than the manikin practice, and I would like to know just what is carried out in 90 hours of manikin practice.

Another thing that will help in the teaching of obstetrics, particularly the abnormal deliveries, breech extraction, face presentation, etc., is the moving picture film. I have had the opportunity of witnessing the pictures taken at the Wertheim Clinic and some of these films were particularly good, especially those showing breech extraction, podalic version and face presentation. They are shown almost as well as these cases could be demonstrated in the delivery room. With the proper apparatus the pictures could be shown repeatedly and stopped at any stage in order to bring out a particular point. I believe such pictures will be of very considerable value in the teaching of obstetrics.

DR. JOHN O. POLAK, BROOKLYN, NEW YORK.—The question is, what and how much should we teach the undergraduate in obstetrics. I have taken the position for a long time that we should limit our instruction in obstetrics to teaching the management of normal obstetric cases and obstetric diagnosis. We have paid a great deal of attention to the antepartum examination. At the Long Island College Hospital each student spends four weeks in constant attendance in the antepartum clinic, and each man will make twenty-five to forty examinations, which are checked up by the man in charge, who is a part time paid instructor. We try to teach the student the aseptic conduct of labor. We know it is not possible to carry into the private home the paraphernalia so common in a maternity delivery room, and so we teach intensive asepsis,—the doctor's hands, the parts of the woman and the operative field are aseptic, and the student must use just as much care to deliver the woman as he would to open the abdomen. Then we teach him the course of labor.

From the first moment the woman falls into labor, he is in attendance and does not leave until she is delivered. He sits up with the patient and without attempting to hurry her dilatation, he records the pains and the results of his examination by rectum, listens to and records the fetal heart every half hour during the first stage. During the perineal stage the heart is studied at intervals of ten minutes.

We believe that labor is a surgical procedure, that the delivery of the primipara is just as important as the opening of the abdomen, and we tell our students that all we can teach them is diagnosis and progress of normal labor. If they want more than that we are willing to give them an internship, and if they want still more, we are willing to give them a residence if they make good. We tell them they cannot expect to go out and deliver a woman if they do not know how to repair an injury and when to interfere. All we can teach them is when to interfere; we cannot teach them how to interfere in the short time available. Here is where the manikin comes in. They can practice forceps and version and breech extractions on it and the first case they have to use forceps on they realize the benefit of this practice. The man who has never handled forceps on a manikin is absolutely at a loss. Every man will have a breech presentation sooner or later, and if he has had no practice in extraction on a manikin he is useless. We do not consider these men skilled, but they get the fundamentals during the course.

We need more hospital facilities, we need full-time men. We cannot teach obstetrics without some full-time men, and these are the facts we have to make known so that the public will give of their money and we can get the hospitals so that this work can be carried on properly.

DR. JOHN NORVAL BELL, DETROIT, MICHIGAN.—I think if they would incorporate in the Sheppard-Towner Bill a clause providing the money to pay a man to teach men how to deliver a normal case we would get good teaching. You cannot expect a man to get up in the middle of the night and go and teach students how to deliver a normal case, and that is the whole sum and substance of the thing. I believe firmly in having a full-time man, or two or three, available in the institution, but they must be men who know how to teach the students to deliver a perfectly normal case.

DR. WILLIAM H. CONDIT, MINNEAPOLIS, MINNESOTA.—I think we have struck the keynote of our future professional needs in our efforts to reduce the morbidity and mortality of the puerperal state. We have made no progress in the last twenty years. The rate of maternal mortality per 1,000 births in 1920, was 15 per cent above the rate in 1919. The United States is fourteenth of all the countries of the world. I think our weakness is in teaching students. The requirements of the students today are so advanced that by the time they are sophomores, they know all to be known in medicine. We, at the University of Minnesota, have our shortcomings, especially in regard to our personal supervision and teaching by the chiefs of the departments. We do little didactic teaching, chiefly quiz work. We have a valuable adjunct in our Fellowship coterie. We have a Fellow or two on a three year course. He has had some actual practice in general medicine and maybe in surgery. The interne is not given any actual teaching responsibility, but the Fellow under the chief is given quite a good deal of responsibility. He is in charge of the Out-Patient Department and the uncomplicated deliveries in the hospital and they are under the supervision of the instructors or of the chief himself. I think this is proving very practical; more time can be spent by him in detail technical teaching of the student. In the last year of the Fellowship he does some operative work, both in gynecology and obstetrics. We cannot help feeling that our students go out pretty well trained. There are some who should never deliver a woman. I had a junior student at the bedside very recently and the first thing he did was

to begin stripping on his glove with his bare hand. Then he rushed up to cleanse the draped patient with nothing but his rubber apron on. We should not be compelled to teach a man the first principles of asepsis in his Junior year when he begins his course in obstetrics. There is evidently weakness in other departments. We cannot make experts out of poor material, but we must try to teach the student so as to prepare him for the practical, bedside, country practice. We must impress the student with the importance of this being a surgical procedure, needing probably more careful and more cleanly technic than even many surgical operations. We do not allow our students ever to make a vaginal examination. We teach the rectal examination and I think that is one of the preventives of many accidents that happen in the country practice.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—Just a word in regard to one angle of this problem that I think has not received due attention and emphasis. After listening to the paper and discussion I could not help being impressed with the undue emphasis that has been laid upon the mechanics of this work. I, for one, do not believe that the mechanics should be overemphasized, especially with the undergraduates. Many of the best teachers are saying that the less you do in a mechanical way the better your patients are cared for. Therefore, I want to call attention to this side of the question for the undergraduate. The point I wish to make is this: If greater emphasis were laid upon the bacteriology and the pathology of the birth canal, and if the students were taught to be alert for all the conditions that may arise, I am sure they will obtain impressions that will not become easily effaced and will prove of greater value than information obtained from the manikin or from much of the outdoor clinic work, or from a certain number of cases conducted in a purely mechanical way. The examination of the placenta is also important. It is a common observation that when this organ has a dirty yellow appearance, in the majority of instances, there is infection. It is important also to know that cross sections of the placenta may reveal conditions which will postulate certain things having taken place before birth, thereby making one alert for persisting pathologic conditions in both the mother and the child. Specimens illustrating the gross and microscopic pathology are invaluable in teaching this subject.

DR. MENDENHALL (closing).—I expected more criticism and am disappointed. I believe that the out-door department must be continuously supervised. If it is so done, it is of inestimable value, but in most institutions it is not so done. Usually the student delivers the patient and does not know whether it is a posterior or anterior delivery.

Dr. Schwarz, I think, misunderstood my remarks on the manikin work. I mentioned ninety hours at one school, but recommended thirty to forty hours. I still believe that manikin work is invaluable. I agree with Dr. Schwarz that work with the patient is better if we can have enough patients. If not, the work with the manikin is second best, at least, for practical experience.

A point that Dr. Polak brought out I wish to emphasize in closing, and that is the question of diagnosis, and how much the early graduate is going to do in obstetrics. In this, I am reminded of my last lecture by Dr. de Schweinitz on diseases of the eye. He told us he was not turning us out as ophthalmologists, but hoped he had taught us enough to know when to call for help from an ophthalmologist. I hope we may teach the students enough to enable them to know when to call for consultation in obstetrics.

DR. MAGNUS A. TATE, of Cincinnati, O., presented a paper on **A Method of Delivery in Normal Cases.** (For original article see page 61.)

DISCUSSION

DR. IRVING W. POTTER, BUFFALO, NEW YORK.—Times have certainly changed. Who ever thought, five years ago, that Dr. Tate of Cincinnati would be giving me credit for anything; and yet, today, he gave me credit for dilating the vagina; and then he goes on and messes up a beautiful labor case. Now Dr. Tate has been to Buffalo; but he didn't stay long enough to learn anything. He reminds me very much of that story of the bull in the china shop,—what he didn't spoil by breaking, he messed up, and that's the way he handled this case. Who ever heard of a patient going under an anesthetic and then waking up, being given a dose of pituitrin, and given an anesthetic again? From the very start we have tried to keep away from dilating the cervix. We have dilated and ironed out the vaginal tract with very gratifying results, but we never dilated the cervix. And why, when he had a cervix he could put his hand in, did he not go on and complete the work quickly by version instead of taking an hour and fifteen minutes to do it?

In my experience it is very dangerous teaching to advocate the use of pituitrin while the child is in the uterus. Reports of bad results have come from all over the country, and that is what we have tried to avoid. We have dilated the vaginal tract and delivered the baby; and, after the baby has left the uterus, we have given the pituitrin. After a few years Dr. Tate will do differently. He will come around to treating his cases in a clean manner. If you dilate the vaginal tract there is no occasion for an episiotomy in any case. I have never done an episiotomy in my life and would not know how to do one; but to allow a patient to have an anesthetic, then let her come out, then give her pituitrin, I do not see the necessity for such a procedure.

I am pleased to have heard this paper because it means that Dr. Tate is coming around to the point where he believes there is some discomfort to the woman in the second stage of labor. I think the first stage is very easy to manage, but it is the long drawn-out second stage that he is trying to get rid of and that we are trying to get rid of, and we feel that we have succeeded better without pituitrin and without the anesthetic by doing a clean version at the end of the first stage of labor.

DR. ARTHUR H. BILL, CLEVELAND, OHIO.—It is very hard for me to discuss a paper when I totally disagree with what has been said. Nevertheless I am afraid that is the case in the present instance. I am in hearty sympathy with anything which tends to make labor easy, but one thing I have always contended is that we should not interfere with the first stage of labor. If the pain is relieved, patients may be allowed to go through the first stage, and in the majority of cases, the head will pass spontaneously through the os. Let the first stage of labor alone and relieve the pain, no matter how long it takes. I am sorry to have Dr. Tate put the patient on a time limit basis. I think that is wrong. Ordinarily, the length of the first stage makes little difference, if the patient is comfortable.

In regard to the second stage of labor, I shall have something more to say in my paper. I wish to go on record as opposed to the use of pituitrin when the baby is in the uterus. I do not believe that all the accidents resulting from its use have been reported, including damage to the baby. We can get along without it. Whenever possible, let Nature take her course during the first stage of labor.

DR. M. PIERCE RUCKER, RICHMOND, VIRGINIA.—I agree with Dr. Bill that pituitrin is a dangerous drug. We have tried it on animals and, if you get any action at all, you get an incomplete tetanus of the uterus. I have tried it on three patients and have confirmed Dr. Haskell's experiments satisfactorily. In the tetanic contraction what are you doing? You interfere with the circulation in the uterus

and produce suffocation of the baby in a great many of the cases. I went over the records of the Memorial Hospital and found the infant mortality twice that in pituitrin cases to those in which it was not given, regardless of the operators. Of course, it sometimes was not used properly, but it is mighty poor comfort to explain to the mother, who has a dead baby, by saying that she was too much exhausted, or something like that. You are just inviting trouble by giving pituitrin before the baby is out of the uterus.

DR. HENRY SCHWARZ, ST. LOUIS, MISSOURI.—I had no intention of participating in the discussion, but I cannot sit quiet and have men tell us that the use of pituitary preparations is as dangerous as they want to make us believe. It is true that you should not use pituitary preparations until you know what platform you stand on. When we, in 1912, tried all the various preparations of pituitrin in the market, when we used Armour's, Burroughs Wellcome & Company's and Parke, Davis & Company's preparations, and others, we did find exactly what you state. Armour's and Burroughs Wellcome's were twice as active as the others. We likewise found out that we must not use teaspoonful doses, cubic centimeter doses, but that we must be careful and approach the case slowly, with two or three minims at a time if need be. We found that we did not get tetanus of the uterus when it was used in that way, and the great advantage of it is that it causes contractions of the uterus which come and go, unless it is used by men who do not know how to handle it. It was first used by us, or we were one of the first, in cesarean sections because in this operation we were always afraid of hemorrhage when we had to open the uterus at a time when the woman was not in labor. In those days we usually had to wait until the woman went into labor before we could operate. Since the advent of the pituitary preparations we select our time for the operation and we have every assurance that we are safe. In the majority of operations, when we give the full dose of a pituitary preparation of some kind, we can be sure the uterus will contract on delivery of the child.

Again, we have proved, not on ten or twenty, but on hundreds of cases, that there is nothing more valuable than pituitary preparations before the baby is born. After the baby is born we want the tetanic contractions so that the uterus does not relapse and accumulate blood and create after-pains; but before the baby is born, we want the intermittent contractions. We have used it on untold cases; and they are all on record, and you are invited to come to Barnes Hospital and look at any of our case records. There are a few thousand of them, and you will find that, in the majority of them pituitary preparations have been used. You will find that in some emergency calls to the home of patients who have had several children, and who are of relaxed habit, babies are born without the assistance of the doctor; but quite often there is hemorrhage; at times inversion of the uterus. In cases in which one can feel the head in the pelvis with the membranes still intact and the cervix open, that the patient may go into labor almost at any moment, we ask them to come to the hospital and then at 7 o'clock in the morning we give them castor oil; that makes them very prone to go into labor; but to make sure of it we give them four to five minims of Armour's or Burroughs Wellcome's pituitary preparation. A doctor and a nurse remain at the bedside, and sometimes a little massage is necessary, but we keep up the pituitrin, give it every few hours in cases of relaxed habit, so as to obtain relief, avoid the danger of hemorrhage, and prevent severe after-pains which are common if the case is left to Nature. As soon as the baby is born we administer a dose of some preparation of ergot to secure tetanic contractions of the uterus.

DR. TATE, (closing).—I do not do a version on normal cases because it is wrong and I do not believe it is good obstetrics.

As to the danger of pituitrin, I have written to the various manufacturers about pituitrin, have read the literature as thoroughly as possible, have had personal ex-

perience, have tried to analyze the various papers on pituitrin; and why some few physicians will not use it, calling it a dangerous drug is beyond me. You would not say you would not use cocaine or ether because once in a while you had a death from it. I consulted Professor Jackson of the Cincinnati University as to the properties and danger of pituitrin, and he said there was no danger at all if a man understood how to use it. That is the ground which I take. The recent books on therapeutics tell you that there is no danger from pituitrin up to 1 c.c., but I never give even 1 c.c., but do give one-third to one-half of a c.c. and never repeat it but once. I have not had a death of a mother and not a death of a child so far, and cases that were from fourteen to twenty hours from the beginning of the labor pains, go three, five or six hours. The gratitude of patients is enough to make me continue this method. Within the next few years I will present my results in case reports. All that I ask is, if you have a normal case, not an abnormal one, try this method and when you have tried it and have seen how beautifully it works, and how grateful the patient is, how the hours of pain are done away with, I think you will agree with me that there is merit in it.

DR. ARTHUR H. BILL, of Cleveland, O., read a paper entitled **The Choice of Methods of Making Labor Easy.** (For original article see page 65.)

DISCUSSION

DR. IRVING W. POTTER, BUFFALO, NEW YORK.—I agree with Dr. Bill that there should be no fads or fancies in obstetrics, but I insist that the use of chloroform is not a fad or fancy. My records prove this. There should be no hurry. Not long ago I kept a woman three days after rupture of the membranes, and then I delivered her of a normal child without injury to her whatsoever.

The occipitoposterior positions occur, he tells you, in about 27 per cent of the cases. I find them in about 60 per cent. But that does not make any difference. The tissues of the primipara seem to stretch and dilate easier than those of the multipara.

In the past year I have delivered 1130 women. My fetal mortality is now about what I have been striving for, 2.3 per cent. We use chloroform; we do versions; we do not use pituitrin until after the baby is out of the uterus. We do not use pituitrin in cesarean sections until after the uterus is closed. There is no occasion for giving it before. Give it after the uterus is closed and you will have no trouble. That is what version does; it obliterates the second stage. Five years ago there was much discussion on this point. There was no shock then to these labors, and many of them lasted a week. Now we hear from many sources about eliminating the shock of the second stage. Five years ago Dr. Schwarz used to go to sleep. He told me himself that as long as the woman was groaning regularly he could snore easily. (Laughter.) Now, all is different, and we are each of us trying to relieve all the shock and suffering possible by shortening the duration of labor without injury to the mother and child.

DR. JOHN NORVAL BELL, DETROIT, MICHIGAN.—On this subject I am quite in accord with Dr. Bill. I like his attitude in the whole matter, especially when he says that we should individualize, that we must not treat these cases all along a certain way. I believe Dr. Potter does a version in all of his cases, or in the vast majority of them. I believe that this is messing it up just as much as Dr. Tate messes it up in his way. I think there is a happy medium, and that is this: to relieve the woman of suffering and get her through the labor in the easiest manner possible. We can give the patient scopolamin and morphine in the first stage. We can administer just enough to keep her comfortable until the cervix has softened up and

the patient is ready for delivery. Then, instead of doing as Dr. Tate does, which is a hard thing to do, though he speaks of its being easy, but I find it difficult—do as Dr. Bill does, wait until they are dilated and then do a version if you wish. But you can anesthetize the patient, and, I think, Dr. Potter has taught us that in this way you can dilate the vagina very nicely with the gloved hand and green soap, and go ahead and deliver the child. Why do a version and get all tangled up with the cord? That is what the version usually means—not in the hands of Dr. Potter because he knows how. My method is to give the patients scopolamin and morphine up to the time the cervix is softened, then give ether, use the forceps, deliver the baby, and the patient is comfortable and happy.

DR. ARTHUR H. BILL, (closing).—Dr. Potter says that if I had stayed in Buffalo and seen all those cases, I would have changed my mind. It would not have changed my mind one iota. I know that he can do versions. We can all do versions. Version is all right in its place. There are cases in which version is advantageous and others in which other methods have greater advantage. There is no question in my mind but that the head will come down spontaneously, as I have reported in 65 or 70 per cent of the cases, in which it will either reach the pelvic floor or pass through the cervix. Thus there will be many cases in which we simply have to lift the head over the perineum, and this is so much simpler and gives so much less disturbance that it appeals to one. So far as the patient's suffering is concerned, there is no difference. The patient is relieved of pain and knows nothing about the birth in either procedure. The question under consideration is the method by which we are to deliver the baby. We are aiming at the same thing in regard to saving the patient pain, but I wish to emphasize the fact that we should choose only those methods of delivery which seem best adapted to the case in hand. I think the obstetrician should familiarize himself with all methods so that he may avail himself of the method that is best suited to the particular case.

(*To be continued in February issue.*)

THE NEW YORK OBSTETRICAL SOCIETY. MEETING OF OCTOBER 11, 1921

DR. RALPH H. POMEROY IN THE CHAIR

DR. FRANKLIN A. DORMAN presented a report of a case of **Primary Sarcomatous Tumor of the Umbilicus.**

The patient, Mrs. T. B., was referred by Dr. John W. Stokes, of Southold, N. Y. Her mother died of intestinal cancer, her father still living and well. Eight years ago she noticed a small growth at the navel about the size of a shoe button, which slowly increased in size, causing no pain or discomfort. During the past year and a half it grew much more rapidly. In November, 1920, it began to pain and this continued at intervals until the operation. The patient lost in weight and developed a cachexia. In May, 1921, she consulted Dr. Stokes, who urged operation, which she declined. Two weeks before the operation the growth began to ulcerate. At the time of operation, July 30, 1921, the tumor was about the size of two fists, fairly symmetrical, somewhat lobulated, with a broad basal attachment about two inches wide. Some of the skin was darkly pigmented and there were two large ulcerations. A circular incision was made about an inch from the pedicle and carried down to the umbilical ring which was widely excised and removed with the tumor. Abdominal exploration revealed no other growths. The patient's recovery was uneventful. Before operation she weighed about 100 pounds, on leaving the hospital she weighed 109½ pounds and her present weight is 127 pounds. She feels well and is growing stronger.

Pathologist's Report.—Macroscopical: Specimen is an irregular, nodular growth 15 x 14 x 8 cm., covered in most of its extent except at the base by skin which shows bluish discoloration and superficial ulceration in two or three places. The base of the tumor, around the umbilicus is fatty, the rest of it consists of soft, marrow-like tissue with large areas of necrosis and hemorrhage. Firm areas can nowhere be found although the consistency of the different parts of the tumor varies somewhat in different areas.

Microscopical: Most of the sections show large areas of necrosis with areas of hemorrhage. Other firmer parts are composed of polymorphous irregular cells varying in size and in shape from round to typically spindle forms. The nuclei are dark and mitotic figures are frequent. Intercellular tissue is easily seen.

Diagnosis: Fibroblastic spindle cell sarcoma with marked necrosis.

DISCUSSION

DR. HERMANN GRAD.—About eight years ago I saw a woman in whom a recurrence took place after an operation for a sarcoma of the umbilicus. The patient was brought to New York about four months later with a recurrence. The mass was about as large as a fist and it had evidently involved the entire thickness of the abdominal wall. At that time Coley's serum was in vogue and we used it together with the x-ray and the mass disappeared without any operation. She recovered completely and notwithstanding the x-ray treatment, she bore a baby about

three years later. She had an amenorrhea for about a year, but this cleared up also. The patient has remained apparently well since. Perhaps these sarcoma are not as malignant as we believe them to be, although this woman had a definite recurrence after a very extensive operation. The tumor in the case I refer to was not so large as the specimen shown here tonight, being the size of a hen's egg and was thoroughly circumscribed. There was no sign of involvement of the peritoneum.

DR. FRANKLIN A. DORMAN.—Dr. Grad, I suppose that was verified by pathological report?

DR. HERMANN GRAD.—Yes.

DR. FRANKLIN A. DORMAN.—We, of course, hope this may not recur. But the chances of recurrence are probable.

There are two points of interest in this case. The first is the size of the tumor. Cullen reports one, the diagnosis of which was not verified by pathologic examination, as large as an infant's head. The second point is, this is a primary growth, of which there are apparently very few on record.

DR. O. PAUL HUMPSTONE reported **A Case of Rupture of the Uterus in a Placenta Previa.**

Mrs. M. R., Hospital 77967, was admitted to the Obstetric Service of the Methodist Hospital having been referred to me by Dr. Howard Langworthy. She was 32 years of age, married ten years. She had five previous labors, all easy, with living children. She had one miscarriage followed by curettage soon after marriage. She had been operated for pelvic plastic repair three years previously, and had one child after that operation. She had not menstruated in seven months. Her pregnancy had been without incident until the morning of her admission, when upon arising from her bed she had a profuse hemorrhage from the vagina without pain or other symptoms.

Examination showed a well built woman, weighing about 140 pounds, a trifle pale, with a pulse of 108 and a blood pressure of 110 over 80. Her blood showed 2,800,000 red cells and 40 per cent hemoglobin. Her urine was normal. The fundus measured 26 cm. and the fetal heart was 130, in the right lower quadrant.

Vaginal examination showed a very soft cervix, not shortened, admitting two fingers to impinge upon the placenta covering the internal os completely, a head presenting at the brim. She was not in labor.

Our impression was a central placenta previa in a seven months' pregnant multipara not in labor.

In the light of these facts, and considering the very slight probability of viability of the child and the evident necessity for immediate interference, after suitable preparation, a No. 3 Voorhees bag was inserted in the uterus beneath the placenta and a light pack placed in the vagina. No anesthesia was necessary. The hemorrhage was controlled and labor came on in four hours. Good pains rapidly appeared and in two hours the bag had been expelled through the cervix. The bag displaced the presenting head and it failed to advance. Profuse hemorrhage occurring, the patient was anesthetized, the long gloved arm inserted through the placenta, a foot grasped and the knee brought to the vulva, again controlling the hemorrhage. The anesthetic was discontinued and I discoursed to the staff on the danger of rupture of the lower zone of the uterus in a placenta previa by immediate extraction. After waiting 30 minutes without a pain I ordered 7 minims of pituitrin given hypodermically. Four minutes later the patient had one agonizing pain, expelled the baby, which was dead, and placenta out of the vulva and bled profusely. Examination showed a rent in the lower zone of the uterus on the

right side extending half way up to the fundus and through the peritoneum. The uterine artery being torn across, I rapidly packed the uterus, filling the cavity and the rent in the broad ligament, the tear in the uterine wall and finally the vagina.

The house surgeon through the abdominal wall pushed the fundus over to the right side and down making as much pressure as possible to control the bleeding. The abdomen was rapidly prepared, the patient given an ampule of pituitrin and 1/3 grain of morphine, hypodermically and taken to the operating room. Her condition was not alarming, pulse 140, of good quality and regular. She was not in shock.

A rapid supracervical hysterectomy was done, the abdomen freed of blood clots and closed without drainage. An intravenous infusion of 1000 c.c. of salt solution was given on the table. The convalescence was disturbed by some abdominal distention with fever for five days. Her blood count the morning after the operation was 1,800,000 red cell and 40 per cent hemoglobin. The patient improved so rapidly that transfusion was not deemed necessary and she left the hospital on the 23rd day after her operation, well.

The proposals we submit for discussion in the consideration of this case are: First; That central placenta previa is a surgical disease demanding hospital treatment. Second; That central placenta previa is best managed by abdominal delivery in competent hands in all cases. Third; That pituitrin should never be employed while the baby is still in the uterus.

There is nothing new in these conclusions but increasing experience in the light of abdominal surgical treatment should have taught us that if extensive tears, rupture of the uterus and excessive hemorrhage and sepsis are to be avoided one must keep away from the lower zone of the uterus in the management of central placenta previa.

DISCUSSION

DR. G. H. RYDER.—I doubt if there is any one here who would not agree that where it is possible, all such cases are best treated in hospitals. Dr. Humpstone's second conclusion is that all severe cases of placenta previa should be delivered by Cesarean. I believe few of us will agree to this. For years, good results have been obtained in placenta previa by delivery through the vagina. The field for cesarean section in placenta previa is a limited one; usually only where the diagnosis is made early, and where there is but little dilatation, with a firm cervix. When the cervix is much dilated and soft, the vaginal route is probably safer. Again where there has already been a great loss of blood, the added shock of a section might be enough to cause death.

In the case reported, Dr. Humpstone started his operation, to my mind, in the right way. He inserted a bag and followed its expulsion by a version and pulling down of a foot and thigh into the cervix. If he will pardon me for saying it, he made three errors in judgment after having selected this method of delivery. These and not the method were responsible for the ruptured uterus. First, he used a bag of too small size. If he had used a No. 4 bag, instead of a No. 3, it would have controlled the hemorrhage as well as did the smaller one. After its expulsion the cervix would have been fully dilated and the delivery could have been effected easily and slowly without danger of tearing the cervix and rupturing the uterus. Second, having used the smaller bag and having performed the version, it would seem to me that the delivery was hurried too much, from then on. If the mother had been permitted to come out of her anesthetic and push the fetus out slowly by her own efforts, taking plenty of time, I believe there would have been no ruptured uterus. Third, I think the use of pituitrin, with an undilated cervix, friable from the low implantation of the placenta, was contraindicated, more especially in the dose given. Dr. Humpstone selected the correct method for delivery of his patient, but used

faulty judgment in carrying it out. I do not think he is warranted, from this experience, in concluding that the vaginal route in previa is to be discarded altogether, and that cesarean section alone is to be used.

Dr. Humpstone's third conclusion is that pituitrin should never be used in obstetrics with the fetus *in utero*. Probably many of us will not agree to this conclusion, for some of us have so used it, over and over again, with only good results. Pituitrin, it is true, should be used with the fetus *in utero* with great care, and practically only in primary uterine inertia and in the absence of any obstruction to delivery; and even then only in small doses. In Dr. Humpstone's case I think its use was contraindicated, as I have said. There was no primary uterine inertia, or the woman would not have expelled the bag by her own efforts; and there was obstruction in the undilated and friable cervix. Moreover, the dose of seven minims given is about twice the safe dose. It does not seem convincing, therefore, to condemn the usage of pituitrin altogether with the fetus *in utero*, because of an unfortunate experience due to its misuse.

In closing, I do not want to give the idea that I am criticising Dr. Humpstone adversely for his trying experience. The complication with which he was dealing, complete placenta previa, is one of the most frightful in obstetrics. Bad results may occur in the hands of any obstetrician, and Dr. Humpstone rescued his patient from grave danger by a most brilliant operation.

DR. JOHN O. POLAK.—There has been some interesting work done by Rucker, of Richmond, in the study of pituitrin, which has been recently called to my attention. It is so graphic that I believe we should take it into consideration. Rucker studied the effect of certain drugs on patients in labor by introducing a Voorhees bag into the cervix, connecting it with a blood pressure apparatus. He tested out strychnia, ergot, morphine, quinine, castor oil and pituitrin. The interesting point in all of these graphs is that while morphine actually increased the strength and length of the contractions, it was followed by uterine relaxation, the smallest dose of pituitrin never permitted a cessation of uterine contractions, the uterus was constantly in spasm from the time that the pituitrin was given. This spasmodic contraction was augmented from time to time by a strong labor pain, but the uterus was never relaxed. That is something which I think we do not realize in the use of pituitrin. Personally, I lost a number of babies in former days in cases in which pituitrin was administered, after the child had passed out of the uterus into the vagina, when the uterus is closely wrapped around the body of the child and the uteroplacental circulation is interfered with. For until we realized just what this placental compression meant and just what it did to the fetal heart, we lost some babies and these deaths must be attributed to pituitrin. I have had two instances where the placenta has been shaken loose in the early stage of labor by the use of pituitrin. These patients had accidental hemorrhage, and death of the fetus occurred in the first stage of labor. I feel more and more that in labor, pituitrin should not be used until the child is out of the uterus.

DR. G. L. BRODHEAD.—I feel that we all agree with Dr. Humpstone that placenta previa cases should be treated in a hospital. In central placenta previa beyond the seventh month I think there can be no question of the advisability of cesarean section. Cesarean section is, however, not the operation of choice in some cases of marginal placenta previa, especially in multipara. If a primipara has a marginal placenta previa and cesarean section is done, it may be that cesarean section will have to be done the next time but we have known normal delivery to follow cesarean section for placenta previa. While the immediate result for the mother and child in placenta previa might be best obtained by cesarean section, personally I do not believe every case of placenta previa demands cesarean section.

As to pituitrin, we should begin with not more than 3 or 5 minims. We have all seen violent contractions of the uterus after 5 minims and occasionally with 3 minims. In placenta previa the lower segment of the uterus is much more likely to rupture than in a normal pregnancy. The degree of effect produced depends on the variety of pituitrin used. I believe that when infundin is used, 3 minims is enough to begin with; later 5 minims can be given if necessary.

DR. FRANKLIN A. DORMAN.—As Dr. Ryder pointed out, we succeed with some cases of placenta previa, but in other cases we do not. In such cases where we follow every precaution and avoid a rupture of the lower segment, the woman does not survive on account of hemorrhage and relaxation. The only possible conditions under which we could have saved some of the patients would have been by an abdominal operation. I personally believe that in cases of central placenta previa, where the baby is beyond seven months, I should have to have a very tempting cervix, with good dilatation, not to resort to abdominal section. The important thing before us tonight is the question of how to handle our cases of central placenta previa at term. Of course, in earlier cases it is a different situation. I would like to put on record a recent case. A patient came to me with a story of being five and a half months' pregnant. She said she had a hemorrhage while she was shopping. There was no strain at all; she was in an elevator and she simply bled. She consulted a specialist, known to all of us, and he told her that she need not pay any attention to it and that it didn't mean anything. It did stop. In a week she had another moderate hemorrhage without any exertion and she went to a general practitioner who told her she possibly had placenta previa and referred her to me. The woman being only five and a half months along, with a closed cervix, but with a story that was so suspicious, I felt it best to send her at that time to the hospital and told her my examination might result in an abortion, but that it was necessary to know the facts. She was anesthetized, the finger introduced into the cervix and it was found that there was placental material present. I put in a bag and she was subsequently delivered by Braxton-Hicks version with very little loss of blood. She had a true central placenta previa and was simply marked for trouble if it had not been recognized.

The point here is that sometimes we might, by paying attention to early hemorrhage, be able to make a diagnosis of placenta previa before the time of viability when the question of emptying the uterus is a relatively simple one.

DR. ROBERT L. DICKINSON.—I would like to ask Dr. Humpstone whether there are available any statistics of the results with cesarean section in central placenta previa, compared with the regular statistics covering results with the older methods of treatment.

DR. JOHN O. POLAK.—Is it not a fact that in central placenta previa the hemorrhage frequently does not occur until the final gush?

DR. O. PAUL HUMPSTONE, (closing).—I think that cesarean section is never indicated if a bag has been put in the cervix. I did not mean to give that impression.

I think that Dr. E. P. Davis in his description of placenta previa, or "ectopic pregnancy", as he calls it, presents probably the most valuable statistics on the success of cesarean section in placenta previa. He also, you may recall, has been very conservative as compared with Dr. Williams, of Baltimore, on the removal of the uterus in these cases as being possibly infected.

I was particularly interested in this question of pituitrin, which not many of you gentlemen referred to. I studied pituitrin during the winter of 1912 and was among the first to use it in this country. I read a paper before this Society (May 14, 1912) advocating as much as four ampoules of pituitrin at a dose, but I want

to put myself on record as having changed my mind. And I want to state that I firmly believe that any man who gets up and talks about using pituitrin while the child is in the uterus has not had the proper experience. I delivered one patient three times, who had a funnel pelvis, with a resulting third degree tear. In her fourth pregnancy she had a larger baby, and when the head came through the cervix and was on the perineal floor, I gave her only 5 minims of pituitrin, and she was torn wide open, went into shock on the table, and died. I no longer use pituitrin while the baby is in the uterus.

DR. HAROLD BAILEY reported a **Case of Hemimelus or So-called Congenital Amputation.** (For original article see page 72.)

DISCUSSION

DR. ROBERT L. DICKINSON.—I would like to ask whether the sulci or grooves were accounted for.

DR. F. R. OASTLER.—I would like to ask Dr. Bailey whether he has any remarks to make about the work of Jacques Loeb, undertaken some fifteen or sixteen years ago, in which he succeeded in causing all sorts of amputations by the destruction of the chromosome bodies in the nucleus of some of the lower forms of animal life, such as mollusks. It seems to me that is probably the best explanation of these deformities that we have, and that it does not occur later on.

DR. J. M. MABBOTT.—I would like to ask Dr. Bailey at what period of development or pregnancy the amputations were supposed to have taken place, and, secondly, whether anything representing amputated parts has ever been found in the amniotic cavity.

DR. HAROLD BAILEY, (closing).—There is no explanation accepted by embryologists or anatomists for the formation of these grooves. It is a fact that never in those grooves has there been found a band or adhesion. However, bands and amniotic adhesions have frequently been found connecting, for instance, one of the fingers to some other part of the child's anatomy, like the leg or the body, and almost all the stories of bands or cordlike amniotic bands, relate to the older literature, strange to say, almost all before 1900. Fieux in 1902 reported a cordlike extremity to which was attached a hand and I think it has to be accepted that amniotic adhesions do occur in some of these cases. The explanation given by most anatomists who have studied this subject is that these are adhesions occurring either from inflammation of the ends of the stump (as you saw, the scar in the one child) or occurring after the injury, or rather after the deformity.

Ballantyne recites all the information about these bands and then ignores it and refers the condition to amniotic pressure in the first two or three weeks of embryologic life, before the amnion separates from the surface of the child. Of course we have all seen some forms of amnion adhesions. (I have in the Cornell Museum a specimen where the amnion is strongly attached to the entire parietal bone on one side). The nature of these grooves is uncertain. Some have referred the condition to the disease called "ainhum," occurring in Brazilian negroes. This is a disease of adult life in which the little toe is compressed by the ingrowing skin and the toe drops off without any pain or evidence of trouble. It is interesting to note that one description states that the patient was surprised to find the toe in his shoe. There have been discolorations of the ends of these stumps in the so-called congenital amputations and evidences of inflammation have been found there. I have no information about the irritation of the chromosomes. Of course, Mall, in his 1908 article said the amputations would have to be laid aside as unexplained

and he felt that the frequent production of extra fingers and the absence of fingers in parent and child might indicate that it was possibly a germinal effect. However, I think that can also be laid aside because all these children have other marked malformations.

As regards time, if this occurs as a form of embryonic failure of the mesenchyme to develop into bone, it occurs before the fourth week and probably the third week of embryonic life.

In my reading I discovered one case record of a hundred years ago or thereabouts, where the leg was first delivered and then the child. I think all such records can be discounted.

Dr. William P. Healy reported a case of **Recovery after Postoperative Tetany Treated with Calcium Lactate,** and a case of **Sudden Death During the Preoperative Treatment of Procidentia Uteri.**

Dr. Healy referred to the fact that from time to time the occurrence of tetany has been noted following various operative procedures, more especially the removal of the thyroid or parathyroid glands, or operations upon the abdominal or pelvic viscera. The prognosis as a rule in postoperative tetany has been had. In recent years a great deal of experimental work has been done, more especially on parathyroidectomized dogs and careful studies of the blood chemistry changes in these animals made before, during and after attacks of tetany.

Probably the most important of the earlier studies were those of MacCallum and Voegtlin. These investigators in 1908 noted that after parathyroidectomy the calcium concentration in the blood and tissues was less and in the feces and urine was greater than normal.

MacCallum and Vogel in 1913 confirmed the above findings and reported an average of 2.7 mg. of calcium per 100 gm. of whole blood in tetany as against 6.1 mg. in normal dogs. Briefly then tetany in these animals was assumed to be a result of calcium deficiency and more especially so since the administration of calcium salts was found to be most effective in relieving the symptoms.

More recently Hastings and Murray in a careful series of experiments on dogs have confirmed the above findings. They showed that the concentration of calcium in the blood decreases rapidly, beginning soon after removal of the parathyroids and they were able to demonstrate repeatedly the temporary curative power of intravenous calcium chloride injections for tetany.

During the last few years cases of tetany have been reported following the intravenous injection of sodium bicarbonate for therapeutic purposes.

In March of this year Dr. Healy reported a series of six cases of postoperative tetany, four of which resulted fatally, due to the administration of large quantities of sodium bicarbonate *per rectum.* These cases received approximately 2400 grains sodium bicarbonate *per rectum* within six hours after operation and, despite the fact that some of it was expelled, enough was retained to bring about the symptoms of tetany.

The following case is reported because a much smaller quantity of bicarbonate of soda was administered, about 600 grains. Mrs. L. P., age thirty-two, married seven years, no children, family and personal history excellent. Menstrual history normal except for severe dysmenorrhea on first and second days. Chief complaints: sterility, dysmenorrhea, severe backache, occasional attacks of dysuria. The patient was a well-developed, healthy-looking woman and the physical examination was negative except for the pelvis. The cervix was lacerated (postoperative) and the uterus was enlarged to the size of a grapefruit by two fibroids.

Operation: Nitrous oxide and ether anesthesia. Duration 1 hour 15 minutes; dilatation of cervix, tracheloplasty, multiple myomectomy and hysteropexy. There was a moderate amount of bleeding during the myomectomy but the patient was returned to bed in excellent condition with a pulse of 100, temperature 98.8°, respirations 22, at 10:10 A.M. At 10:45 morphine sulphate gr. 1/6 (hypo); 11:45 rectal enema containing 192 grains glucose, 300 grains sodium bicarbonate, 40 grains sodium bromide and 8 ounces tap water, at a temperature of 106° was given and retained; and at 3:15 P.M. the enema was repeated without the sodium bromide. At 6:00 P.M., temp. 103.4°, pulse 130, respirations 10.

The patient was conscious but her respirations were very shallow and slow, the pupils were not contracted and responded to light. She was given atropin sulphate gr. 1/150 (hypo), about 7:00 P.M. She voided 5½ ounces urine, the pulse and temperature continued to rise and at 8 P.M. were 104.8°, pulse 130, respirations 10.

Despite the high temperature, rapid pulse and slow respirations the patient did not complain. She was fully conscious and mentally quiet but rather restlessly moved her arms and legs about.

She received no further sedative and went through the night fairly well with a little disturbance from nausea until 6:45 A.M. when she suddenly complained of stiffness of her hands and a numbness and tingling of the entire body and difficulty in breathing.

The examination showed the typical bilateral tonic spasm of tetany involving both hands with also slight flexion of wrists and elbows, associated with this about every three minutes a wave of numbness would sweep over the body accompanied by rapid breathing and intense spasm of gastric and abdominal muscles with vomiting of an ounce or so of clear fluid.

The anxiety of the patient was extreme and her requests for relief were insistent.

Calcium lactate, gr. 20, with half an ounce of lime water was given by mouth every half hour for six doses, beginning at 7:30 A.M. and the greater part seemed to be retained. By 11 A.M. the spasm of the hands was much less marked but the tachycardia and attacks of numbness and rapid breathing still continued and at 11:35 an intravenous injection of 100 c.c. water with 1 gram of calcium lactate was given. The result was most striking, before the injection was finished the tachycardia and all the other symptoms disappeared and the patient became most comfortable. Thereafter the convalescence was normal.

It seemed to Dr. Healy that the symptoms of this case can be explained by a more rapid absorption of sodium bicarbonate into the blood stream than the kidneys were able to take care of by elimination because of a temporary depression from the operative procedure and this brought about a disturbance of salt metabolism especially in the balance between sodium and calcium.

This balance was restored by the administration of calcium salts and the symptoms disappeared.

The history of the case of the sudden death during the preoperative treatment of procidentia uteri, was as follows: Mrs. D. K., age thirty-three, widow, one child in 1914, instrumental delivery. Menses of the 28 day type, duration 4 days, moderate flow, no pain. Last menstruation 2 weeks ago. Complaint, prolapse of the rectum and of the womb, duration 6 years, the prolapse of the womb appeared some time before the rectal prolapse. Bowels normal and no bladder symptoms present. No subjective symptoms except the annoyance due to the protruding masses. Examination showed a well nourished, healthy-looking female of rather large frame. General physical examination negative except for pelvic lesions. Prolapse of rectum 3½x5 inches, readily reducible through a tremendously dilated and relaxed sphincter ani. Complete prolapse of uterus, adnexae and vagina forming a tumor mass

4x6 inches with extreme thickening and edema of the mucous membrane of the vagina and cervix. The prolapse was readily reducible but would promptly reappear.

The plan of treatment instituted was rest in bed, with daily vaginal douches and support of the uterine prolapse with boroglyceride and ichthyol tampons. The prolapse of the rectum was more difficult to retain as it invariably came out with each bowel movement.

It was expected by this treatment to reduce the engorgement of the prolapsed tissues and to improve the chances of an operative cure.

During the first two days in the hospital the uterus and the rectum prolapsed with each bowel movement, thereafter the former remained in place but the latter had to be replaced after each stool. There was some bluish discoloration and edema about the vulva. The patient was not allowed out of bed and by the 19th of August, two and one half weeks after admission to the hospital the edema and more or less brawny induration of the tissues about the vulva and vagina had considerably diminished, and on the morning of the 19th the patient was placed in a wheel chair and transported about twenty-five feet to the examining room and placed on the examining table, in order that we might make a careful estimate of the progress of the treatment to date and decide as to the feasibility of an early operation. As the patient was placed on the table she seemed to have a desire for a bowel movement and asked for a bedpan, which was given her, after waiting two or three minutes it was noticed that her lips were becoming cyanotic and that she was breathing rapidly, she was placed upon a stretcher and returned to bed at once, her only complaint being shortness of breath and a sense of suffocation. There was no pain at all, the pulse rate was 130, the entire body was covered with a cold perspiration, the breathing rapidly failed and within five minutes of the onset of the attack the patient was dead. There had been a careful physical examination of the patient on several occasions and the heart and lungs seemed to be quite normal.

A careful postmortem examination of the thoracic viscera failed to establish the cause of death.

DISCUSSION

DR. J. M. MABBOTT.—I have been impressed in hearing cases reported and in reading them to find how recklessly, I may say, morphine is given hypodermatically to aid the anesthesia for operations. In listening to the case of tetany, which is from my limited knowledge, a clear enough case of tetany, I was impressed by the fact that the respiration was so slow, but as I recall it, the pupils were contracted and the house surgeon treated the case with atropin, from which I assume that there might be a morphine element in the case, and it causes me to inquire as to whether Dr. Healy knows exactly how much morphine had been given to that patient, if any, in the preparation for the operation.

DR. WILLIAM P. HEALY.—There was no preoperative morphine given, Mr. Chairman, and the pupils were dilated, not contracted. One-sixth of a grain of morphine was given in one dose.

DR. WILLIAM PFEIFFER reported a case of **Intraligamentous Ectopic Pregnancy.**

Mrs. E. M., age thirty-four, white, married, entered Kings County Hospital at 4:00 P.M. September 19, 1921. Chief complaint: Abdominal pain. Had the usual diseases of childhood. Denies any venereal infection. Past history otherwise negative. Married fourteen years; husband thirty-nine years old, in good health. One

child delivered by forceps thirteen years ago, a normal puerperium following. A later pregnancy terminated in miscarriage at six months, followed by two subsequent abortions of early gestations, all of these of spontaneous origin requiring no operative interference for their completion, and without sequelae. Patient noted burning on urination with frequency only during the occurrence of present symptoms; retention for part of this time before admission.

To show the worthlessness of the average history the following is noted from the record of the interne. "Menses started when fourteen years old; always regular, never painful, lasting five to six days." Date of last menstruation omitted. On close questioning after operation, the following is the correct history: Menstruation usually of thirty day type, five to six day habit, and with very little pain. Last period June 11, 1921, and typical except that it was a day or two early. At no time subsequently was there any bleeding, staining or spotting until a few days before admission to the hospital. Patient believed herself pregnant but was told by her medical adviser that the amenorrhea was due to anemia and kidney trouble, and that the uterus was empty.

On or about July 25, patient had dull sacral pain continuing for a few days, accompanied by one spell of vomiting with fainting. This was repeated one week later. Three weeks before admission or about the latter part of August, there occurred cramp-like pains over the lower abdomen and extending as described by the patient "up to the heart." These were inconstant, varying from 5 to 30 minute intervals and evidently of not severe character as they did not prevent sleep. This continued until three days before admission when pain became severe and cutting in right lower quadrant but gradually lessened and were described as "drawing," relief being obtained by local applications of cold.

Examination of upper abdomen negative. In hypogastrium was a mass extending from symphysis to one finger's breadth above the umbilicus, definitely outlined and extending somewhat higher on the right than the left. It gave a sense of fluctuation and felt more like a bladder full of urine than like a uterus. Catheterization excluded this. No fetal heart heard, or fetal movement felt or heard. Tenderness and some rigidity over entire mass especially in the right lower quadrant. No vaginal bleeding at present. Normal parous outlet. Cervix in normal vaginal axis, long and soft, with slightly restricted mobility; pressure on cervix causes pain. External os admits the finger tip. Body of uterus not definitely palpated because of rigidity. The mass above described seems to be above and behind uterus while there is nothing definitely palpable in either fornix except a sense of fullness and pain on palpation.

The uterus was the size of a three months' pregnancy and displaced to the left, a definite sulcus palpable between uterus and the mass to the right. Pressure on cervix not transmitted to the mass. Right fornix appears slightly full.

Blood examination: Red cells, 3,150,000, hemoglobin 80 per cent. White cells, 14,350, polynuclears 87 per cent, lymphocytes 12 per cent, transitionals 2 per cent, eosinophiles 1 per cent.

Urine drawn by catheter:—Amber, sp. gr. 1022, alkaline, albumin and sugar negative, amorphous phosphates many, no casts. Culture shows B. coli.

Wassermann negative. Temperature on admission 98° F., pulse 80, respirations 24. No record of blood pressure.

Provisional diagnosis: Uterine pregnancy complicated by ovarian cyst with a twisted pedicle.

Operation, September 23, 1921. Median abdominal incision from umbilicus to symphysis. On opening the peritoneum a small amount of fluid and clotted blood was found and there presented a smooth, regular mass in the midline about the size of a four months' uterine pregnancy. This was found to spring from the right

side and to have displaced the uterus to the left, though that organ instead of being a three months' size was no larger that at six weeks; it was, however, soft and contracted under the hand. The mass was dark in color, soft, fluctuating, and loosely attached here and there to the surrounding coils of intestines. It was broken during the handling, causing the discharge of considerable fluid and clotted blood, followed by a fetus of about four months' development, and alive. The placenta followed without effort to remove it and it was then seen that the product of conception had come from within the folds of the right broad ligament, the upper part of which now resembled a "blowout." The bleeding was severe and was controlled by clamps placed on the base of the right broad ligament. The only part of the tube seen was a small portion about 1½ inches long at the right cornu. This was removed with the portion of the broad ligament above the clamps and the defect closed over. Right ovary not identified at any time; left tube and ovary normal. A few tabs of organized clot on the intestines from adhesions to the mass not removed. Abdomen closed in layers without drainage. Time of operation one hour and five minutes. Pulse before operation 102; after it, 120; after return to bed 98, and thereafter never rose above 100. Blood pressure one hour postoperative 110/70; one and a half hours p.o. 125/80; two hours p.o. 138/90; three hours p.o. 140/90; nine hours p.o. 145/95.

Aside from slight discomfort caused by gas, convalescence was uneventful. Sutures removed on tenth day, union primary.

On discharge October 6, 1921: Primary union in the incision, scar firm and not tender. Pelvic floor and cervix as on admission. Uterus normal in size, position and mobility, not tender. Left adnexa not palpable. There is a very small tender exudate in the culdesac.

Postoperative diagnosis: Intraligamentous pregnancy.

Conclusions: I believe that the primary rupture of the tubal pregnancy took place about the time of the first dull pain when the vomiting and fainting occurred; that there were further hemorrhages into the ligament at dates corresponding to recurrences of symptoms and that the final phenomena were the manifestation of erosion of the walls of the ligament with beginning secondary rupture found at time of operation.

DISCUSSION

DR. HERMANN GRAD.—I had an experience last summer with a woman twenty-five years old, who was still nursing her eight months' old baby, and was taken one morning with very severe abdominal pain. I saw her about three hours later, at which time a tentative diagnosis of ectopic was made, but in view of the fact that her condition was good and there were no pelvic findings, it was thought best to wait for further developments. She improved very rapidly and I saw her a week later and there were absolutely no symptoms, the blood and urinary findings were normal and there was no further pain. She was allowed to get out of bed. We were undecided as to the diagnosis of ectopic. Four weeks later she was again taken sick. She was up and about and was again seized with severe pain and was taken to another hospital, a ruptured ectopic into the right broad ligament was found at operation. There were several coils of intestine adherent to it. There was no fetus present, but the outer portion of the tube had ruptured. It was removed and the patient made a good recovery.

I believe it is very difficult to diagnose these cases because there are so very few symptoms present.

Department of Reviews and Abstracts

Conducted by Hugo Ehrenfest, M.D., Associate Editor

Collective Review

THE VIEWS OF PRIMITIVE PEOPLES CONCERNING THE CARE OF THE PARTURIENT WOMAN*

By Jonathan Wright, M.D., Pleasantville, N. Y.

WE now may turn our attention to the methods of care for the parturient woman. We have already seen that not infrequently she gets no care. Ratzel[50] says: "We are told of the Kirghises of Semipalatinsk that in extreme cases they will place the woman on horseback, with a rider, in order that a wild gallop may accelerate the operation of nature. 'Sometimes it does good, sometimes she dies.' * * * At Nij Noukha they leave a woman in childbirth to herself; among the Mussulman Georgians in the province of Zakataly * * * the poor woman, when her pains come on, is even driven from the living rooms as 'unclean,' and has to seek some stable or barn, where she must bring her child into the world without any help, nor for a period varying from five to seven days may she return to her family and go about her household affairs." "In Africa," Livingstone[51] says, "the poor creatures are often placed in a little hut built for the purpose and are left without any assistance whatever. * * * The women suffer less at their confinement than is the case in civilized countries; perhaps from their treating it, not as a disease, but as an operation of nature, requiring no change of diet except a feast of meat and abundance of fresh air. The husband on these occasions is bound to slaughter for his lady an ox, or goat, or sheep, according to his means." In Western Thibet, "the mother always goes through her time of trial alone, unless, which is frequently the case, there are other married women near by, who can conveniently attend her."[52]

While the woman is thus occasionally left alone at this moment of her extreme need, according to our notions, this is not usually the case. Help, or the attempts to furnish it, is usually at hand, but it can scarcely be doubted that much which is furnished had better be left unperformed; but the readiness to supply such as is in their power or knowledge, sharply differentiates the treatment of the human female from that of the brutes, and it is worth while to note this in studying the origin of altruistic and humanitarian practice. When a

*See Review of Literature on Menstruation in this Journal, January, 1921; on Conception and Puerperium, May, 1921; and on Labor, August, 1921.

child is born to an Esquimaux woman "the mother is attended by one or more of her own sex; even the husband is not allowed to be present. If it is a first child, the birth takes place in the usual tupic or igloo; if it is a second, or any other than the first, a separate tupic or igloo is built for the mother's use and to that she must remove."[53] At the Antipodes, in South Africa, the Kafir woman also used a separate hut for her confinement. Shortly before the birth of her child "she cuts grass on which to lie while secluded in her hut. * * * The husband is not allowed to be in the hut while the baby is being born, but several women act as midwives, the woman's mother being the most important person on such occasions."[54] In Polynesia "the woman is isolated in the bush in a newly built hut, a poor protection against the weather; any married woman attends her for pay—all others are excluded and the father doesn't see the child for at least fifteen days."[55] In Alaska, "in former years the universal practice was for the Thlinget[56] mother to lie outside of the house in a booth or in the bushes. A hole was made in the ground and lined with leaves or moss, and the newborn babe was deposited in it." In Central Africa "a Yao woman,—sometimes at any rate, if not always,—used to go out into the bush a few days before the birth of a child. One or two women would go with her, to put up a little grass shelter and look after her."[57] In Australia "when the time of her trouble draws nigh, some one of the old women is selected to attend her and the two withdraw from the main camp and shelter themselves in a little rudely constructed 'Miam.' "[58] "Among the Giljaka the act of parturition is looked upon as partly unclean, and cannot under any circumstances take place in the house, at the domestic hearth. Therefore, not only in summer, but even in winter, in the fiercest frost and snow storms, the women about to have children are taken into buildings for them near their dwellings. The place chosen for this purpose is, for the most part, in the private part of the grounds reserved for the women, so that it is quite plain that it is due to no reverence for the act of parturition that the women are thus isolated. The men are obliged to keep entirely away from the neighborhood."[59]

"On the Bonin Islands, as formerly in Japan, there are special lying-in-huts."[60] It is convenient to cite these two excerpts in close apposition. From what has preceded, the almost universal isolation of the parturient women, usually in a fresh hut, sometimes in the bush, we may conjecture that out of what may well have been some blood taboo, as was the case with the Giljaka, and perhaps for some similar magic reason among the Mexicans, we have arrived at a very close conformity with the best modern obstetric practice. Occasionally of course there was a faulty technic. At a much higher stage of civilization, among the ancient Mexicans, as with us, Bancroft[61] says, on the authority of de Sahagun: "The 'hour of death,' as the time of confinement was named, having arrived the patient was carried to a room previously set in order for the purpose, here her hair was soaped and she was placed in a bath to be washed." This, however, is only a flash of a suggestion of modern ideas in a civilization, doubtless much higher than we are accustomed to attribute to prehistoric Mexico. Among the Ovaherero in South Africa "immediately after a woman has given birth to a child, a small house is built for her, at the back of her own house, where she remains until the navel string has separated from the

child."[62] In an Australian tribe, she remains in her husband's hut but "during her confinement her husband lives elsewhere; the neighboring 'wuurns' are temporarily deserted; and every one is sent away from the vicinity except two married women who stay with her."[63] She remains in the living hut until confined, but this is exceptional. It is interesting to see again how out of an entirely false theory grew up a practice, buttressed no doubt by the observation of favorable results, which under the limitations of the environment could scarcely be improved by a modern obstetrician. Not on account of aseptic doctrine, but because of the taboo based on the theory that the *woman* was "unclean," not the hut. On the Lower Niger women are under the care of a particular deity. "Even after confinement the greatest care is taken of the mother and infant."[64] Of asepsis and antisepsis in the strict sense of the words, there is little or no trace. In Abyssinia[65] in spite of the complete absence of aseptic precautions and of ordinary elementary cleanliness, in spite of lack of care of the linen, for on this occasion the woman puts on her oldest nightdress reserving the new for her getting up from bed, in spite of the fact that the chamber where the birth takes place is the common room, where they choose the most obscure corner, shielded by means of curtains against the light and prying eyes, in spite of the fact this common room is full of dust, of chaff and even of manure, since the mule, the goat or the sheep are often lodged beneath the same roof (true scene of Bethlehem), separated from the family sometimes only by a thin wall broken and pierced by a door—in spite of all these things, almost never does one observe any puerperal infection and still less any tetanus of the mother or of the infant through the umbilical cord.

One of the most striking things to be gleaned for the modern accoucheur, from the obstetrical practice of the primitive woman is the position assumed by her during labor. A wife of a King in Baganda "was confined in the same position as ordinary women. She was held in front by one of the midwives, while the other was behind ready to receive the child, a barkcloth only being spread on the floor for her to kneel upon. When delivered, the child was laid upon a plantain leaf, and those present waited for the afterbirth. When this came away, the umbilical cord was cut, with a bit of reed taken from the doorway, if the child was a boy, and from the fireplace, if it was a girl. The midwife washed out the child's mouth with her finger and a little water, and blew in the child's mouth for a few moments, to cause its breath to be sweet."[66] A very circumstantial account is given of the actions and customs* attendant upon childbirth in this region by the Rev. Mr. Roscoe. They concern the mother as well as the father, but they are painfully disgusting to read and without special interest which cannot be more comfortably satisfied in other ways. Curr[67] says that in Australia "aboriginal women always bear their children while they kneel; and sit back on their heels, their feet being laid on the ground, soles uppermost—a common posture always with them when sitting. One of the women attending sits behind the woman in labor, and puts both her arms around her waist, thus forming a support for her back. The other midwife will attend to her as

*The literature of these is of great interest and very voluminous and may be found extensively abstracted in the various volumes of the Golden Bough of Sir J. G. Fraser.

necessity requires. Parturition always takes place in this posture."* Among the Melanesians and the Polynesians, Brown[68] speaks of the woman being "delivered in a squatting position, sitting like a frog." Neuhauss[69] says that in New Guinea parturition ordinarily takes place in a kneeling posture and Pilsudski[70] states that on the island of Sachalin the patient is delivered in a sitting position and is obliged, during the act, to keep herself perfectly straight. In the Andaman Islands[71] during the first two or three days the parturient woman remains in a sitting posture, propped up by articles arranged so as to form a couch. Of the Sinaugolo it is said: "Labour takes place in the bush, where the woman, half squatting on a cocoanut (to support the perineum?) grasps with her hand a young sapling or other convenient upright, or failing these, a rope hanging from the bough of a tree; should labour pains, however, come on suddenly at night the child is delivered in the house no attempt being made to convey the woman to the bush."[72] It is for the modern obstetrician to explain to us why other postures are assumed today.

The manipulations of the midwife, and it is a woman who is almost invariably in attendance, are not extensively recorded, but for the most part it is explicitly stated that the mechanics of labor are not interfered with, though we have seen the horse-back riding of the Kirghis women to produce expulsion of the fetus, which, by the way we cannot help believing is not to be looked on as routine practice. The Australian woman who receives no assistance in any way in her expulsive efforts rarely dies in childbirth.[73] It is exceptional to find primitive woman, as is related of her on the Andaman Islands, held by her husband "who supports her back and presses her as desired."[74] As we reach higher civilizations we find the ancient Mexican midwife, on the authority of Sahagun, quoted by Bancroft,[75] rubs and presses "the abdomen of the patient in order to get the child into place." This perhaps might be considered meddlesome interference, but the extent to which this might go in emergencies is illustrated in a further note. "The Teochichimes husband undertook the office of midwife when the birth took place on the road. He heated the back of his wife with fire, threw water over her in lieu of a bath, and gave her two or three kicks in the back after the delivery, in order to promote the issue of superfluous blood. The newborn babe was placed in a wicker basket, and thrown over the back of the mother, who proceeded on her journey." In some tribes on the other hand the woman receives much careful attention after childbirth. On the Niger the African woman is "washed first of all with hot water; palm oil—which is considered to be medicinal in its effects—is rubbed all over the abdomen and applied to the wounded parts, and the former is then bound very tight with a cloth by the old women midwives. A big fire is kept in the room, and the mother is fed three times a day, plenty of palm oil and pepper being put into her food. Besides this, she is washed three times a day, and spirit or palm wine, fortified by alligator pepper, is administered internally, in the belief that it warms and regulates the womb."[76] In Polynesia[77] the attendant women sometimes remove the placenta when adherent. Left to herself she adopts

*This has an interesting connotation in the most ancient Egyptian literature, (Budge, E. H. M.: Osiris and the Egyptian Resurrection, 1911) and may be found alluded to in Galen: Natural Faculties III. 3. (Daremberg's translation, vol. II p. 288.)

such measures as she can to hasten the process. Women of the Central Esquimaux "in childbirth will try to cause vomiting by tickling the throat with the finger. It is believed this will facilitate the expulsion of the afterbirth."[78] There can be no doubt this is far more efficacious than some of the magical practices, as for instance in Northern India. " 'Among the Konkan Kunbis, when a woman is in labour and cannot get a speedy delivery, some gold ornament from her hair is taken to a Rûî plant (the Dhâk Callotropis gigantea of Northern India), and after digging at its roots, one of the roots is taken out, and the ornament is buried in its stead. The root is then brought home and put in the hair of the woman in labour. It is supposed that by this means the woman gets speedy delivery. As soon as she is delivered of a child, the root is taken from her hair and brought back to the Rûî plant, and after digging at its root the ornament is taken out and the root placed in its former place.' The idea seems to be that the evil influence hindering parturition is thus transferred to the plant."[79] Again in the Mexican civilization we find advanced interference on the part of the midwife, who, de Sahagun says,[80] "was very skilful and dextrous in her duties. When she saw that the baby was dead in its mother because it did not move, and that the patient was in great pain, she then placed her hand in the parturient canal, and with a stone knife cut the body of the baby and drew it out by the feet."

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(To be continued.)

Selected Abstracts

Sterility and Sterilization

Dittler: Parenteral Injection of Semen. Muenchener medizinische Wochenschrift, 1920, lxvii, 1495.

In this work, confined to rabbits, semen was injected into the blood stream to determine whether, by a reaction akin to acquired immunity, the established affinity of sperm and ovum could be impaired, or even altogether destroyed. It had already been proved that semen parenterally acts as an antigen, developing a spermotoxic substance demonstrable in the blood stream. Can this substance be concentrated in the ovum to a degree where the latter will be able to develop an absolute resistance to the sperm? Employing corpus luteum extract has led to relative sterility in the male (apparently a "hormone reaction"). Temporary sterility in the female has been produced by parenteral injection of whole testicular extract, but these experiments were not sufficiently controlled to warrant scientific conclusions as to the nature of the reaction taking place.

In the author's research, whole, fresh, rabbit's semen (collected at copulation) was injected into the vein of the ear, and repeated 2 to 10 times at from 1 to 8 day intervals, the total semen injected varying from 2 to 5 c.c. Only such female animals were employed as had gone through at least one normal pregnancy. A part of the work was done under serologic control, i.e., the injections were continued until the blood of the animal showed definite spermotoxic properties (determined by agglutinating power as compared to a control).

In this stage, absolute sterility obtained towards the sperm of the animal whose semen had been employed for injection. Only after weeks or months did fruitful conception take place. One single (and correspondingly large) injection did not suffice to produce sterility: repeated doses at definite intervals apparently are required to produce sterility. Repeated doses of 0.2 to 1.0 c.c. did not interrupt a pregnancy already in course, which seems to indicate that the sperm quickly loses its identity and its original affinity for the sperm antibodies. In the determination of the specificity of the antisperm reaction of one species as against that of another, it was found that rabbits treated with human semen did not develop sterility. During the course

of the injections laparotomies performed, frequently revealed freshly developed corpora lutea; therefore, the sterility existed in spite of a normal process of ovulation.

The author believes the resulting sterility is due to an undetermined combination of "immunity reaction" and direct hormone action, the former playing the major rôle. S. B. SOLHAUG.

Hoehne: The Physiology of Conception. Zentralblatt fuer Gynaekologie, 1921, xlv, 1047.

Hoehne studied seven tubes from patients known to have had sexual intercourse prior to operation. Examining the tubes one, two, three, and seven days after known coitus, he found one dead spermatozoon in the neighborhood of the infundibulum of the tube after a lapse of 20 hours. This contradicts the finding of Nuernberg, who had positive results 13 to 15 days after the last coitus. The question is worthy of further study. Hoehne also reported the discovery of an unfertilized human ovum obtained through irrigation of the uterine cavity. This was the result of numerous experiments made in the hope of finding an unfertilized ovum some ten days after the beginning or five days after the end of a normal menstruation. The ovum in this case was relatively small, its maximum diameter being only .07 mm. H. M. LITTLE.

Graves: The Gynecologic Significance of Appendicitis in Early Life. Archives of Surgery, 1921, ii, 315.

That the appendix may undergo considerable grades of inflammation and yet be restored to a condition of approximate normality is seemingly an established fact. That the serofibrinous exudates thrown out during an attack find their way into the pelvis is granted. That these exudates frequently lead to extensive adhesions is well known. It requires, therefore, little speculation to assume that this process not infrequently involves the adnexa of young girls following more or less acute attacks of appendicitis. The adhesions thus formed may interfere with the normal development of the ovaries or obstruct the pateney of the tubes. Graves has found the adnexa so embedded in adhesions as to be indistinguishable and the uterus undeveloped, years after an attack of appendicitis in early life.

This condition is, at times, the direct cause of later dysmenorrhea and probably also of ectopic gestation later, but Graves feels that it is especially important as a cause of sterility. He, therefore, urges prompt operation in cases of appendicitis in young girls, not simply on account of the appendix, but because of the serious harm which may be done to the adnexa. He reports three cases in which there appeared to be a direct relation between the adnexal adhesions and nondevelopment, and foregoing attacks of suppurative appendicitis, for which operation had been performed in earlier life. R. E. WOBUS.

Couvelaire: Sterility in the Female. Le Progrés Médical, September 17, 1921, p. 438.

In reviewing the statistics of Paris, Berlin and Rio de Janeiro, the author finds that about 13 per cent of couples who have been married for 14 years are without children. About 60 per cent of such childless marriages are attributable to the woman, while in the remaining 40 per cent, the causal factor may be found in the male.

In this article Couvelaire deals only with the factors which cause sterility in the woman stating that they are due either to some pathology, congenital or acquired, in the genital tract, or to some functional disturbance of the individual.

The prognosis for conception in cases of congenital pathology is good when such pathology can be, and is corrected. A good prognosis also generally exists following correction of acquired pathology unless such pathology involves both tubes and ovaries.

So far as the functional disturbances are concerned, Couvelaire considers first those cases where there is a delay in the appearance of the menstrual function. He finds that 70 per cent of women in whom the menses appear between the ages of 16 and 19 years of age are capable of conception. When, however, the menses do not appear until after the nineteenth year, about 60 per cent will remain childless.

So far as amenorrhea is concerned, he states that where this condition is due to lactation, the probability of conception is lessened. There also exist those cases of unexplained amenorrhea which when the organs are normal are capable of conception.

Dysmenorrhea he considers under the head of diminished flow associated with lessened ovarian function and excessive flow associated with hyperactive ovaries. In the first case he advocates the use of ovarian and thyroid extracts together with a rigorous diet, such as the one outlined by Pinard. In the latter type he employs the use of mammary extract, claiming in both cases that the possibility of conception is greatly enhanced by such treatment.

THEODORE W. ADAMS.

Reynolds and Macomber: Diagnosis in Sterility. New York State Journal of Medicine, 1920, xx, 373.

Reynolds and Macomber condemn strongly the far too common step of persuading a woman into an operation for the correction of an abnormality on the basis that it may be the cause of sterility. Such advice can be given only by one who has taken the trouble and acquired the skill of determining with such degree of accuracy as is at present possible, whether this particular abnormality is or is not the cause of the sterility which exists between this patient and her husband.

R. E. WOBUS.

Max Huhner: Methods of Examining for Spermatozoa in the Diagnosis and Treatment of Sterility. New York Medical Journal, 1921, cxiii, 678.

The author advises examination of the cervical contents obtained by pipette as soon after coitus as possible. The presence of live spermatozoa within the cervical canal indicates that semen sufficient for impregnation has been received and that the cervical and vaginal secretions are not inimical to the vitality of the spermatozoa. Where only dead spermatozoa are found within the cervix, examination of a condom specimen is necessary to determine whether the fault lies with the husband or whether the spermatozoa have been killed by the secretions of the wife. Where hyperacidity of the vaginal secretions is suggested as the cause of death of the spermatozoa, a repetition of the first test following a sodium bicarbonate douche before the coitus will make the diagnosis and suggest the cure. Where no spermatozoa at all

are found, further careful examination of both husband and wife is required to determine the cause of their absence. Examination of specimens taken from the fundus uteri demonstrate the absence of any mechanical interference with the ascent of the spermatozoa into the fundus and tubes, as well as any inimical action in the endometrium. The author gives his technic in detail. MARGARET SCHULZE.

Rubin: The Nonoperative Determination of Patency of the Fallopian Tubes. Journal American Medical Association, 1921, lxxv, 661.

A not infrequent cause of sterility is occlusion of the fallopian tubes which may occur in the absence of palpable lesions of the adnexa. An operation was formerly necessary to determine the patency of tubes. To obviate this difficulty, Rubin injects oxygen into the abdomen by means of a canula inserted into the uterus and connected to a gas tank. A manometer is connected to the line and indicates the pressure under which the gas flows. In normal cases, the gas passes through the tubes at a pressure as low as 40 mm. of mercury and usually at between 60 and 80 mm. If the pressure indicated by the manometer rises to 150 mm. or more, it is reasonably certain that both tubes are occluded. A minimum of 100 to 150 c.c. of gas are used unless it is desired to take advantage of the pneumoperitoneum produced for radiographic purposes. In this case somewhat more is required.

Under proper precautions, this method has been found to be harmless. It is indicated in all cases where it is desirable to know whether the tubes, or a remaining tube, are patent. Its only contraindications are active pelvic inflammation or infectious processes of the lower genital tract. R. E. WOBUS.

Talmey: Frigidity and Sterility in the Female. Medical Record, 1921, c, 631.

Copulation is conditioned upon three potencies and procreation requires an additional potency. There is necessary (1) the potency of voluptas or the transcendental desire of the individuals of the two sexes to unite. (2) This union must give the two parties a certain satisfaction or libido. Libido lacking, union becomes disgusting and is avoided altogether. (3) There must be facultas coeundi. For procreation must be added the facultas generandi. There must be living spermatozoa and ova and the genital tracts of both sexes must be pervious. Lacking one of the four faculties, the individuals are suffering from impotence. Impotence of voluptas or true frigidity is exceedingly rare in men or in women. The transcendental attraction between the sexes is never absent in man from infancy to old age. Inherited frigidity is occasionally found in low idiots. Impotentia coeundi, the idiopathic impotence of copulation is also a rare occurrence in either sex. But the pathologic or rather acquired impotentia coeundi is the impotence common in the male, while in the female it is rare. Painful copulation due to acute genital inflammations is not real impotence in the strict sense of the word. If the woman is willing to bear pain, copulation is possible. Idiopathic impotence of libido is very rare. It is sometimes found in men in cases of grave neurasthenia. It is a frequent anomaly in the female and is falsely named frigidity; it ought to be calidity for they are suffering either from relative or absolute orgasmus retardatus. Impotentia generandi,

the idiopathic impotence of fertilization or sterility is rare in either sex, but the acquired impotence of procreation is very frequent. Half of the sterile marriages are due to azoospermia of the male as a result of gonorrhea and at least 90 per cent of the cases of sterility of the female are caused by the infection of the wife from her husband. Talmey regards electricity the best remedial agent in the treatment of endometritis, metritis, salpingitis, ovaritis, and pelvic peritonitis. Its use is strictly contraindicated where there is pus. The author believes that dyspareunia and lack of orgasm are not rarely the cause of sterility, and that electricity is of great therapeutic value in these cases.

C. O. MALAND.

Nassauer: Treatment of Sterility. Muenchener medizinische Wochenschrift, 1920, lxvii, 1463.

The author briefly reviews the known causes of sterility in the female emphasizing the probable importance of the rôle played by the internal secretions and deriding simple anteflexion of the cervix, simple retroversion of the corpus uteri and especially the "stenosis of the cervix" as causes of sterility.

He holds that the nervous element as a factor in producing sterility has been overlooked and proposes it as the underlying cause for the so-called "stenosis of the cervix" which is only a temporary uterine cramp. Dilatation therefore is not indicated nor successful (because the internal os remains unaffected by this procedure). It is fair to assume that uterine cramps like those excited by the irritation of a sound, occur during coitus (a parallel is found in vaginismus).

Sterile women, by whose temperament it may be assumed that this phenomenon occurs, are treated first for their nervous condition—rest, tonic, change of surroundings, etc. Then the author employs an instrument which he calls "das Fruchtulet," an aluminum tube (sides perforated) that conforms to the size and shape of the cervical passage, extending from just above the internal os to the external os where it is joined to a doubly concave, centrally perforated button that fits the portio and also serves to gather the semen and guide it into the uterine cavity via the cannula in the cervix. It leads to an improved circulation of the uterus, the uterine contractions do not recur, and hence the instrument serves the double purpose of maintaining the passage open for semen to pass, and of preventing its expulsion after having reached the uterine cavity.

The "Fruchtulet" is inserted (repeatedly if necessary) shortly after menstruation and allowed to remain until just preceding the following menses. The woman is advised to remain quiet, with buttocks raised, for some time following insemination.

The author reports four cases where the employment of this device was followed by impregnation of patients long sterile.

E. B. SOLHAUG.

Bandler: The "Higher Up" Theory of Sterility and Its Relation to the Endocrines. New York Medical Journal, 1919, cix, 309.

After excluding gross inflammatory conditions and tumors, Bandler thinks that sterility is largely a matter of endocrine dysfunction and remediable by the administration of the proper gland extracts. He

claims that corpus luteum extract aids in the implantation of the ovum in the uterine mucosa. In threatened and repeated abortions he has used for years a combination of thyroid extract, arsenic, bichloride of mercury and stypticin with good result. At present, however, his usual treatment of sterility consists in the administration of the extract of the whole ovary, thyroid and ovarian residue. To this he adds other endocrines as seem indicated. This, he thinks, should be the routine method of treatment.

In case of failure, he advises some operative measure, either in the cervix or "higher up," e.g., "curettage in cervical and uterine adenoids," and has seen pregnancy follow the resection of polycystic ovaries. If the husband is at fault, he should be fed on endocrines.

R. E. WOBUS.

Wessel: A New Method of Temporary Sterilization. Zentralblatt fuer Gynaekologie, 1921, xlv, 75.

While chronic nephritis, tuberculosis, heart disease, diabetes, certain psychoses, osteomalacia, and marked pelvic contraction, are recognized as indications for sterilization, the various methods heretofore employed for the purpose have been effective only when performed so that the result is permanent. There are certain cases, however, where temporary sterilization might be of value, as, for example, in the case of tuberculosis susceptible of cure, and for such purposes Wessel describes the technic carried out by Gutbrod on some six cases during the past two years. The technic consists in opening the inguinal canals on each side, as in the Alexander-Adams operation, passing up to the peritoneum about the round ligament, and, after depression of the ovary into the fold of this peritoneum, securing it much as the stump of an appendix is peritonized. Wessel believes that, when required, the ovary may be freed from its peritoneal covering, and that it will function as before. Unfortunately the results have not been uniform, one failure in six being attributed to too rapid absorption of the catgut. In the remaining cases the ovaries are palpable and are about the size of a walnut on each side, but the patients are without symptoms.

H. M. LITTLE.

Schiffmann: The Question of Sterilization by Means of Ligation of the Tubes. Zentralblatt fuer Gynaekologie, 1921, xlv, 464.

Sterilization by ligation of the tubes has not proved a success. The difficulty of occluding the tube by means of ligatures has long been known from animal experimentation. To four human tubes examined by him some time after this operation the author adds a fifth case: a twenty-eight-year-old woman, who had been operated upon for complete prolapse and had been sterilized by means of thin silk ligatures placed with the maximum of care. The prolapse recurred and the patient returned to the clinic seven months later. At this time the tubes were secured for histologic study. The ligatures had not produced complete occlusion of the lumen of the tubes. Schiffmann finds that the anatomic results of ligation are practically those described by Kalliwoda: Distention of the vessels, narrowing of the lumen of the tube without atresia, the appearance of flattened cubical epithelium with decrease of the infolding of the mucosa and, particularly,

atrophy of the musculature. Ligation of the tube will not necessarily result in atresia and sterility. Any reliable operation on the tube depends upon resection and careful occlusion of the free ends between the leaves of the broad ligament. Resection alone is sufficient in operations such as uterine interposition. This is probably due to the pull on the ampullar end of the tube, which keeps the cut ends separated. The writer has seen no case of pregnancy in 100 cases of interposition operations in which the tubes were treated in this way.

H. M. LITTLE.

Van de Velde: The Question of Sterilization. Nederlandsch Tijdschrift voor Geneeskunde, 1921, lxv, 2920.

The cause for which a sterilization operation is performed being frequently of a temporary nature, it is desirable to have at our disposal a method for temporary sterilization. With this end in view, attention has been directed mainly at the tubes, however, it seems the less we disturb the tubes, the better. Upon this conclusion, efforts have been made to bury the ovaries in such a way that they may again functionate upon being liberated. It has been found, however, that when buried in the broad ligament, the ovary becomes so covered by connective tissue as to prevent the discharge of ova after liberation of the organ. The Alexander-Adams operation, in which the ovary is buried outside the inguinal ring, has the disadvantage that the organ so placed is subject to trauma and often becomes painful.

Van de Velde attempts to overcome these disadvantages by burying the ovaries in the vesicouterine pouch. The ovary is partly mobilized by making a small incision in the fimbria and ovarian ligaments. This is carefully enlarged without injuring any of the blood vessels. Bleeding must be carefully controlled, the blood supply not disturbed and the organs handled very gently. Taking the ovary and tube between thumb and fingers, a slit is made through both layers of the broad ligament just below the ovary and the latter pushed through this opening. The edges of the broad ligament are sewed to the mesovarium with interrupted silk sutures, care being taken to avoid leaks and not to interfere with the blood supply. The vesicouterine pouch is then obliterated by sewing abdominal to visceral peritoneum, making use of the round ligaments.

The author has performed this operation nine times and in one case had occasion to liberate the ovaries after a number of years with the result that the patient soon afterwards conceived and, in due time, gave birth to a living child. Later on she was delivered of another healthy child.

R. E. WOBUS.

Flatau: Sterilization by Knotting the Tubes. Zentralblatt fuer Gynaekologie, 1921, xlv, 467.

The author notes that Nuernberg had collected 36 methods of sterilization prior to 1917, and believes that probably half a dozen others have been described since that date. About 6.5 per cent of all cases operated on are unsuccessful, and, though this is probably a low figure, it is evident that no one operation is simple and successful. Division, incision, extirpation of the tube or its ligation with catgut or silk, have all been tried, also the compression of the tube with forceps or

with the angiotribe. Flatau himself in five cases, where there had been extreme compression for five minutes, with resultant tissue-paper-like appearance of the tubes, was absolutely unsuccessful. All became pregnant later. For this reason he began to try knotting the tube. The technic is extremely simple. The tube is freed from the upper margin of the broad ligament and a true knot is made about its middle, and the incision in the broad ligament is closed by a continuous catgut suture. This has been done in six cases. The results are so far uncertain, but the operation is suggested as simple and worth a trial.

H. M. LITTLE.

Madlener: Answer to Flatau's Paper on Sterilization. Zentralblatt fuer Gynaekologie, 1921, xlv, 825.

Madlener objects to Flatau's claim that Madlener's procedure is unsatisfactory and unreliable. It consists in the crushing of the middle portion of each tube by means of a heavy forceps and placing a ligature of non-absorbable material into the pressure groove. The writer insists that his method has proved useful in his own hands.

H. M. LITTLE.

Hellendall: A New Method for Tubal Sterilization. Zentralblatt fuer Gynaekologie, 1921, xlv, 822.

There is no safe procedure of artificial sterilization available which would permit restoration of normal tubal or ovarian function if at a later date this seems desirable. Sellheim planted the fimbriated ends of the tubes extraperitoneally by drawing them into the inguinal canal. Gutbrod in a similar manner changed the position of the ovaries. But all these operations failed in certain cases to actually sterilize the patients. Pregnancies have occurred. Nuernberger pulled the fimbriated ends of the tubes into the vagina through an incision into the posterior culdesac. This leads to various disturbances. Hellendall modified this latter procedure by fixing the tubes into the abdominal incision at the occasion of a ventrofixation. H. M. LITTLE.

Hellendall: Pregnancy after Ligation of Both Tubes. Medizinische Klinik, 1921, xvii, 1116.

A forty-three-year-old woman was operated upon for inflammation of the ovary, and during the course of the operation both tubes were ligated and cut to effect sterilization. Three years later, she returned with the history of having menstruated regularly every three weeks for six days until recently, when she had been bleeding steadily for four weeks. On examination the uterus was found to be soft, the cervix closed and the uterine cavity 10 cm. long. There was slight bleeding at the time. During curettage a small piece of tissue, the size of a bean, was removed. The Pathological Institute returned a diagnosis of placental tissue. E. D. PLASS.